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COMPUTER WEEKLY

Number 635 Thursday, January 11, 1979 Price 18p

Surprise entries in software Honour Roll

A LARGE number of old favourites have been joined by some surprising new entries in Datapro's 1978 software Honour Roll, the US user survey.

Compiled this year from nearly 6,000 user responses, the annual Datapro software survey reported on 260 packages. Of these, just 30 met the stringent requirements for inclusion in the Honour Roll.

Last year, 32 products were recognised. Ten of these have been dropped this year, leaving a core of 22 with at least two consecutive years in the Roll.

Five of the packages have now been included in all of the six years that the list has been published. These include ADR's The Librarian, Pansophic's Panvalet, SDI's EPAT and the Disk Utility System from Westinghouse.

Two programs, Fast/Dump/Restore from Innovation Data Processing, and Syncsort from Whitlow Computer Systems have now appeared in five consecutive years.

And three products featured for four consecutive years include Westinghouse's Westi and Computer Associates' CA-Sort, though the latter first appeared in the Honour Roll under the name PanSort when the US licence was held by Pansophic.

Traditionally dominated by utility software, the 1978 Honour Roll is notable for the growing place taken by much larger software systems. The list includes two DOS-replacement operating systems, two TP monitors, and three DBMSs.

Packages appearing under these categories for the second or subsequent time were EDOS from the Computer Software Company (2nd year), Westi, Cullinane's IDMS (3rd year), and Software AG's Adabas (2nd year).

New entrants in these categories include Allergn's Shadow II (the first UK-developed product on the Roll) and Hewlett-Packard's Image/3000 database for the 3000 series.

Packages appearing in the Honour Roll for the first time include Univac's BEM (an interactive Basic Editor Monitor for OS/3), and Goal System's Faqs partition balancer for DOS/VS, IBM's 360/370 RPG compiler.

While Westinghouse is only one of several firms to have two products in the Roll, its UK operation, Westinghouse Management Systems, has the distinction of being agents for six of the Honour Roll packages.

In addition to the Westinghouse products Westi and Disk Utility System, the company handles Flee/Film and Faqs, both developed by Goal Systems, Innovation's FDR, and Quik-Job developed by Systems Support Software Inc.

Most surprising omission from the 1978 Honour Roll is SDI's Grasp, which had previously been one of the elite packages featured every year since the Roll's inception.

NEWS IN BRIEF

Takeover of Dictaphone

ANOTHER giant firm in the office systems business is being formed by the takeover of Dictaphone Corp by Pitney-Bowes, the maker of postage meters and office machines. Pitney-Bowes is to pay $120.4 million for the dictating machine company, producing a combined concern with an annual turnover of approaching $1 billion.

Dictaphone will continue to operate under its present management and name, as a subsidiary of Pitney-Bowes. It will bring with it considerable on-going development work in the field of the "electronic office," at present including voice digitising, voice recognition, and dictation management (CW, November 2, 1978).

ICL pay rise

WITH pre-tax profits of £37.5 million (CW, December 21/28) overall payments of 10.9% on basic rates have been paid to ICL workers who, according to the company, qualify under the terms of last year's self-financing productivity scheme. ICL's financial year ended in September and the final quarter bonus was 2.5%.

Bankrupt

THE Norwegian state-owned Tandberg consumer electronics, instruments and computer peripherals company has been declared bankrupt, but it is hoped that parts of the company will continue in business. The Norwegian government withdrew an offer of £5 million additional support when it learned that substantially more money would be needed to avoid bankruptcy.

Univac plans for the '80s

Dr Borgerson

A BACK-END database system using relational techniques, natural language input and output, higher capacity disc drives and 5,000 gate self-checking chips, are just a few of the developments under way at Univac for the computers that will begin to appear in the mid and late 1980s, according to Dr Barry Borgerson, the company's director of research and technical planning. Univac currently spends $150 million a year on research and development.

"In general, I see a growth in the attachment of specialised units to mainframes: things like array processors and database processors," Borgerson told Computer Weekly in an exclusive interview.

"We are working on a database backend which will be a combined relational and network database, with the common features microcoded. It will keep the same DMS-1100 interface, but will offer greatly improved performance," he said.

He sees processor costs falling steadily. "The requirement facing us is to increase the functionality of the equipment we sell, at the same price to the end-user as he is paying for today's machines.

"That means that we must make the new machines easier to use, more reliable, and include more debugging aids in hardware, so that the user is paying a constant rate of money, but is getting more capability for his investment.

"Natural language voice input and output is already available in a primitive form, with a large front-end unit, but present-day systems need to be tuned for each user," he said.

"The front-ends can be made much smaller, and the tolerances to different voices can be greatly widened. Big programming jobs will still be done using procedural languages, but applications like airline reservations and goods ordering would be appropriate for voice systems."

He does not see a threat from bubble memories to large capacity moving head disc drives, although he believes they will probably take over from fixed-head disc drives and floppy discs.

"We are looking at thin-film disc heads using semiconductor techniques, with a much smaller gap between the head and the disc surface. Drives with multiple arms and multiple heads on each arm are also likely," he said. "The amount of information stored could also be increased by the use of better coding techniques, using tertiary rather than binary arithmetic to get more data in a given disc space."

The principal technologies that Univac is working on for very-large-scale integrated circuitry are short-channel N-MOS and Silicon on Sapphire, SOS C-MOS.

"When you get say 5,000 gates on a single chip, the debugging requirement becomes severe.

"We will have to make self-checking chips to get round this problem, because the number of wires that can be taken off the chip is a severe limitation."

Univac has both electron-beam and X-ray equipment for drawing circuits. "A promising alternative to writing directly on the chip seems to be to use electron beams to draw the masks, and to use X-rays to etch through the masks," he said.

"IBM is building an experimental Josephson Junction machine," he said, "but I do not see them bringing out a product in this technology in less than a decade. It takes five years from the time when the fundamental development is complete to the product appearing on the market, and even longer in larger systems."

Privacy laws survey

If the Data Protection Committee's proposals for privacy legislation are put into law (CW, November 16 and December 7, 1978), the effects on the computer industry and the work of those in it will be immense. To enable people in the industry to make their views known on the wisdom and implications of the proposals, a survey is to be carried out by the Institute of Data Processing Management in association with Computer Weekly.

A questionnaire is currently being drawn up which will cover such areas as involvement and cost to the DP installation, user relationships, and new application design. The collated findings will be submitted to Parliament and the government, as well as being published in Computer Weekly.

Members of the IDPM will receive the questionnaire. Anyone else in the industry will also be welcome to reply to it; they will be invited to contact the IDPM to ask for a questionnaire to be sent to them.

Bristol gets Inmos research centre

AFTER some weeks of uncertainty Inmos, the National Enterprise Board's microelectronics subsidiary, has confirmed that its research centre is to be in Bristol (CW, December 21/28, 1978). It is also intended to set up four production units at one or more locations in the UK.

Professor Iann Barron, UK director of Inmos, said that a decision on the location of these plants would be based on data gathered by a study being carried out by management consultants PA International.

A questionnaire has already been sent to all regional development authorities in the UK, all county authorities in assisted areas, and all other local authorities that had shown interest in getting Inmos to set up operations in their areas.

Professor Barron said the questionnaire would also be sent to any authority that applied and it was hoped that they would all be returned before the end of February. After evaluation a further study may be needed, said Barron, and it was unlikely that any decision on the location of the first plant would be made before the middle of 1979.

The plan for the US semiconductor manufacturer, Mostek, to set up a European operation (CW, December 14, 1978) is also moving forward and chairman Joe Sevin says the choice now lies between Scotland and the Republic of Ireland.

Home entertainment of future

DESPITE US forecasts that companies like Texas Instruments and IBM may beat traditional TV manufacturers to the potentially enormous market for integrated home information systems (CW, October 12, 1978), UK TV manufacturer Thorn does not intend to let the market slip away. The company, which is considering taking a stake in the US microelectronics industry (CW, December 21/28, 1978), has assembled a mock-up of the home entertainment centre of the future, incorporating flat-screen TV, viewdata, audio and video recorders, computer terminal, floppy disc unit and multiple CRT monitors.

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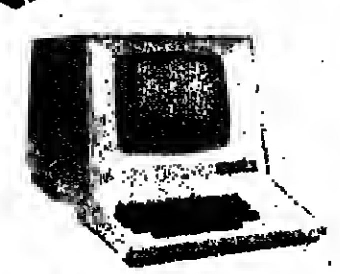

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Briefing

Mini system from STSC

A PACKAGED minicomputer system based on the Magnuson M80 is to be marketed by Scientific Time Sharing Corp. To be known as the Quad 100, the system will run STSC's proprietary APL*Plus software under the control of IBM's OS/MVT operating system.

It will be capable of operating both as a stand-alone system and as an extension to the time-sharing service, and will be available in two models with power exceeding an IBM 370/138 and 148 respectively. First deliveries are expected within the next three months, according to the firm's UK operation, APL*Plus Ltd.

Dictaphone sued

A SHAREHOLDER of Dictaphone Corporation is suing the firm and Pitney-Bowes over the proposed takeover of the dictating machine maker (CW, January 4). Betty Bader, of Brookfield Centre, Connecticut, claims that the agreed terms for the takeover are "unfair and inequitable".

Consortium

INCORPORATION of the National Enterprise Board's office systems consortium (CW, October 12, 1978) is expected within two weeks. The board says it will be announcing the names of the firms involved "shortly". They are expected to include Logica and CTL among others.

Pet winner

WINNER of the Livingston Hire competition at the Compec exhibition, to find a slogan to promote microprocessors in industry, is D. J. Martin, a design engineer with Grundy and Partners, of Stonehouse, Gloucestershire. Martin, who wins a Commodore Pet for his creative efforts, succeeded with the saying "Products sell when they think as well".

Peers is back

AFTER standing down as chief operating officer of Logical Machine Corp during a period of illness (CW, September 14, 1978), John Peers has assumed that role again and Jerry Brandt, who took over from Peers, has left the company. Peers said that Lomac is running profitably again and is close to signing a UK distributor.

ICL chairman Tom Hudson to retire

IN the ICL annual report, mailed to shareholders last week, chairman Tom Hudson makes the surprise announcement that he plans to retire during 1979.

"My 65th birthday occurs in a little over 12 months from now, and I expect before that anniversary to retire and hand over to someone else," he writes.

Hudson joined IBM (UK) in its infancy in 1951 — when it had a staff of three — as sales manager. Three years later he became managing director, and when he departed, 11 years after that, the company had grown to a thriving 6,000-strong organisation. He joined the Plessey board in 1967, and became the Plessey representative on the ICL board on the company's formation in 1968. In 1972 he became chairman of ICL (CW, March 2, 1972), and was responsible for the appointment of Geoff Cross as managing director later that year.

Coupled with Cross' sudden resignation in November 1977, Hudson's departure from ICL will mark the end of an era for the company — the end of the period in which the company transformed itself from what was widely regarded as the lamest of lame ducks into a multinational corporation doing more than half its annual billion dollars of business outside the UK, and one given as good a chance of survival in the cut-throat mainframe business as any of its US competitors bar IBM.

In his message to shareholders, Hudson describes his experience with ICL as "a most exciting and stimulating one.

"I am proud," he adds "to have been associated over those years with very many excellent men and women who have served ICL so well."

The process of finding a successor has begun.

Indian college wants DAP

DISCUSSIONS are under way which could lead to the respected Administrative Staff College of India, ASCI, becoming one of the first customers for ICL's Distributed Array Processor.

Dr Utpal Banerjee, head of the computer department at the college, is on a whistle-stop tour of European capitals, and when he visited London at the end of December, he had lengthy talks with ICL, the Ministry of Overseas Development and the British Council.

"It is all at a very early stage and nothing has been agreed as yet, but we are hoping to get a grant from the UK Overseas Development Ministry which would allow us to have an ICL 2976 as a front-end to the DAP. The total sum involved would be £2 million, £1.85 million for the hardware, £200,000 worth of spares, £100,000 worth of software and training, plus educational packages and the Filetab data management package."

As a new and unique product, the DAP is as yet short of software, and among matters discussed with ICL was the possibility of ASCI writing Fortran software for the DAP. Dr Banerjee is thinking of putting five analysts on the project, and producing £12,000-worth of software.

The Hyderabad college is already experienced in writing advanced software for foreign clients, mainly the Russians. The college currently has a Ryad ES-1030 which is being paid for in software (CW, July 6, 1978), and Dr Banerjee's first port of call after leaving India was Moscow.

"The cost of the computer was five million rupees, about £380,000, but they asked for Rs 7.5 million of software for it. We have done Rs 6.4 million so far, but while I was in Moscow, they

● Turn to page 5

Such a friendly robot

Last Saturday, leggy and lithe New Avengers star Joanna Lumley presented small and portly Altorgon the robot to 12-year-old Fiona Mackey of Rickmansworth, who won the Altorgo "My Friendly Computer" competition, at the BCS 78 Young Computing Fun Fair. In our picture, Fiona, holding her winning entry, is seen with Joanna and Altorgon, which includes a radio/digital clock and tape recorder/calculator. The Fun Fair was an overwhelming success with almost 5,000, including 3,825 children, crowding the Bloomsbury Centre Hotel where it was held. The Fun Fair was part of the BCS specialist group event (see pages 2, 3, 7).

Siemens works on 16-bit single chip micro

A 16-bit single-chip microcomputer is under development by Siemens, in West Germany, with a projected launch date of early 1980.

Siemens is also negotiating with Advanced Micro Devices (AMD) with which it owns the joint venture company Advanced Micro Computers (AMC), over the choice of another 16-bit microprocessor.

Siemens has been tied closely to Intel, with the 8080 and 8085 processors, and will be offering support for Intel's 8086 device.

AMD, however, is now working with Zilog on the development of the latter's Z8000 16 bit processor, and its peripheral devices. So it seems possible that while supporting the Intel 8086 Siemens could second source the Zilog Z8000 as part of its commitment to AMD.

Though details are as yet scant, Siemens' own development will include a measure of on-chip ROM, and possibly RAM and I/O capability as well.

Takeover

SYSTEMS software products supplier Turnkey Systems Inc is being taken over by the big US based timesharing bureau, National CSS. Best known for its Taskmaster teleprocessing monitor for IBM machines, TSI is likely to become a largely autonomous software products division of NCSS. Headquartered at Norwalk, Connecticut. TSI has a subsidiary in London and is now opening offices in France and West Germany.

Police computer security probe

POLICE investigations are taking place into an alleged breach of security at the Police National Computer Centre in Hendon.

In Nottinghamshire, the investigation is looking into the alleged breach of PNC information security by a police sergeant on the force there, who is now suspended pending the results of the investigation.

It is alleged that the sergeant supplied vehicle ownership information from the PNC to unauthorised individuals who attempted to use it for commercial advantage, and that these individuals were private detectives employed by Ladup, the casino division of Ladbrokes.

Such information could have been gained via the Force Control communications centre in Nottingham or by simply phoning or radioing in an enquiry to the PNC centre.

GTE the favourite for US Prestel system

AGREEMENT with one or more US companies seeking rights to the Post Office's Prestel viewdata system only awaits formal signing of the Post Office-Insac contract giving the latter exclusive US marketing rights.

Although ITT and RCA are possible contenders, front runner is GTE, the telecommunications giant currently seeking FCC approval to acquire packet-net operator Telenet.

GTE has revealed plans to test-market a business viewdata system, but has not acknowledged talks with Insac. The burst nature of viewdata traffic makes a packet network the ideal vehicle, and Telenet plus viewdata would be a powerful combination. Insac managing director John Pearce expects agreement with one or more US companies "within two months."

United Leasing Ltd

IN an article published in last week's issue of Computer Weekly on the subject of computer leasing, the headline could have given the impression that one of the most well known third party computer leasing companies, United Leasing, is immediately withdrawing from the computer leasing business.

This is not a true and accurate reflection of United Leasing's current situation, as can be gathered from the article. However, our article should have stated more clearly that it is United Leasing's intention to curtail its investment in any further new IBM 303X series processors by the middle of 1979. From about that time, United Leasing will diversify its business activities into other leasing areas.

We apologise for any unintentional embarrassment that might have been caused to United Leasing and to anyone else as a result of these inaccuracies in the article.

INSIDE THIS WEEK'S CW.....

The fight for the business market is a tough one and there is now a wide variety of systems challenging for a share. In this month's Marketview, Fred Lamond surveys the equipment on offer and outlines the advantages and pitfalls that can benefit or baffle the user (page 20) . . . George Cogar offers an arithmetic solution to the language problem (page 21) . . . The fashion for distributed processing continues unabated and Morris Edwards looks at some of the decisions that have to be taken to ensure the efficient handling of a company's data resource (page 23) . . . These articles and the usual round up of news from all over the world are featured in the International Section (pages 17/24).

THE FOUNDATION..... In the first of a new monthly series from the Butler Cox Research Foundation, David Butler examines the changing role of corporate management services . . . Page 14

ALSO.....

Computerview — Beware of pi in the sky . . . 2

Role of the PR person . . . 4

Michie's Privateview . . . 5

Software File . . . 6/7

On Spot . . . 8

Micro News . . . 15

JOB VACANCIES: PAGES 25-71

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COMPUTERVIEW

Beware of pi in the sky worship

IN a brilliant speech that sparkled with a clarity of thought and sharpness of wit that is rare on the computer punditry scene, Murray Laver last week got the BCS annual lecture series off to a great start (see page 3).

Under the title "The significance of computing", Laver ranged across a wide spectrum of systems and social-impact-of-computers issues. And he highlighted one particularly important aspect that is seldom mentioned, the worship of numbers, which he called "a pernicious heresy, numerolatry".

Laver rightly explained that computing tends to give a false importance to numerical facts. "This not only widens the gap between the numerate and the majority," he added, "but has encouraged some of the semi-numerate to espouse numerolatry, the idolatrous worship of numbers; an unwholesome version of pi (sic) in the sky."

Numerolatry, he continued, is spawned by the common confusion between precision, accuracy and significance.

As a male chauvinistic example he said, "A lady may inform you with impressive precision that her age is 29¼ but experience suggests an accuracy of give or take five years. And if the inaccuracy is around ten years, it is not significant anyway."

In this case, as Laver stressed, the convention is understood and no social problem arises. However, he added, "each day the mass media report commercial and economic facts, such as trade figures, whose probable errors span at least the last digit or two of their quoted value and whose significance may be low, if not zero. The media then proceed to analyse the transient and meaningless fluctuations of these figures with great solemnity.

"That these quantities often emerge from expensive computers lends their specious precision an air of authority and significance in no way justified by the accuracy of the primary data."

Laver then prescribed three remedies for any who suffer the odd twinges of numerolatry, and Computerview commends them to our more susceptible readers.

The first Laver remedy is to "report on rising, and after meals, the formula: 'Remember Man Friday'. This serves to remind the patient that the only numbers to be found in natural or human phenomena were left there by some man, who has often put his foot in it. Quantitative facts are not the most important, only the easiest to calculate with."

The second remedy is "to distrust any numerical fact that appears in public without an accompanying statement of its probable error: this copes with chronic dislocations between precision and accuracy and can be particularly efficacious when applied to the monthly trade figures."

Laver's third nostrum is "to consider what action you feel obliged to take when the extreme right-hand digit of some statistics change by plus or minus 1 and then successively cut off right-hand digits until the action becomes important". This, claims Laver, can be a "sovereign remedy for inflamed significance and can be applied daily to the Stock Exchange share index".

HINCHLEY . . . breaking down the barricades of fear. See "How to build on success."

A related risk of numerolatry highlighted by Laver is "to treat facts as if they really were the independent, neutral things they seem to be when they emerge from an incorruptible machine.

"We are occasionally urged to let the facts speak for themselves," he explained, "but this is what they cannot do because, as playwright Pirandello once said, 'A fact is like a sack, which won't stand up when it is empty'. To fill it we need to understand why, how and for whom it was defined and collected as it is, and exactly what processing went on before we were allowed to see it.

"Unless we stay on guard we may build a susceptibility to data illusions into our information systems, and that would be a highly significant result of our increasing dependence on computing," he concluded.

This warning about numerolatry, together with its cures, is of relevance both to systems builders and users, and Murray Laver is to be thanked for expressing it so well.

Congratulations are also to be given to the BCS 79 organising committee for providing the first platform for the new series of BCS annual lectures and for choosing the inaugural lecturer so wisely.

How to build on success of BCS 79

SATURDAY, January 6, is likely to go down in UK computing history as a turning point in the relationship between the computing community and the rest of society, as well as being a milestone in the development of the British Computer Society which, hopefully, indicates the start of a new, outgoing and vigorous phase in the Society's growth.

For, last Saturday, the BCS 79 Young Computing Fun Fair opened its doors to the wide-eyed, eager enthusiasm of the young, who came in their thousands to learn about, play with and understand the new technology that will be such a vital part of their futures.

There were laughter and balloons, funny hats, eager fingers and, above all, questions, questions, questions. In the eyes and minds of the young, there was none of the fear and the doubts about computing that cloud the vision of those who have grown up ignorant of the new technology and therefore apprehensive about the unknown.

Even though there was a great deal of fun and games, many of the children said that the most interesting things were the lectures, and there was great interest in the careers in computing talks and literature.

The whole UK computing community is indebted to the BCS 79 organising committee, under the chairmanship of Andrew Hinchley, and the Fun Fair Committee under Steve Shirley, for providing such a practical and positive way of breaking down the barricades of fear and the barbed wire of ignorance which has separated the computer technologists from the rest of society for so long. There should also be a special word of praise for Hinchley, for he was also a prime mover and organiser of the ACM/Computer Weekly Hedsor Park meeting in July 1977 on the impact of information technology on society.

Hedsor provided a major impetus in the computing community to examine information technology in a coherent framework, while BCS 79 has provided a major initiative in turning some of the Hedsor debates into positive actions outside the computing world.

The Saturday Fun Day was the culmination of the three-day BCS 79 event, with the first two days concentrating on the raison d'etre and lifeblood of the BCS — the primarily technical discussions and learning generated by the BCS specialist groups, with a liberal sprinkling of awareness about the social impact of the technology.

This technical conference was one of the best attended (with over 500 paying delegates) and most lively conferences held recently in the UK.

Admittedly, the quality of the sessions varied greatly and there was a lack of overall coherence about the conference theme. But then it must be remembered that the specialists groups rely on voluntary labour and there was a tremendous amount of effort put into getting the show on the road.

Hopefully, however, BCS 79 will be taken up by the BCS hierarchy and membership as a cue to recapture the Society's sense of direction, confidence and vigour.

For too long the Society's financial difficulties have cast a shadow which has led it to adopt some rather undignified postures and to take some unlikely bedfellows.

For example, the Datafair conferences, which were originally large scale, unashamedly academically-oriented events degenerated to the commercially-oriented conference last year, indistinguishable from conferences run by commercial conference organisers and attracting only about 200 paying delegates.

Despite its higher attendance figures (around 5,000 including the Saturday event), BCS 79 is likely to make a paper financial loss. But that was primarily because it aimed to appeal to the ordinary BCS member and the general public, so ticket prices were rock bottom.

Yet, for the first time in many years, BCS 79 has provided a positive answer to those who have questioned the value of the Society's existence.

The initiative of BCS 79 must be seized and followed through. Most important, the grassroots energy, enthusiasm among its members, and the smiles and excitement generated on the Saturday should be harnessed quickly.

As Computerview recommended before Christmas, get happy for 79.

Ten years ago...

COMPUTER WEEKLY JANUARY 9, 1969

SCICON introduced Umpire, its mathematic programming package . . . The Spillers group ordered a sophisticated online management system from Burroughs, worth £1,100,000 . . . It was disclosed in Parliament that the use of computers had lengthened the time in dealing with claims to the Department of Employment . . . Nabisco Freers, the biscuit company, launched a pilot scheme for a full stock control and distribution system . . . A new core memory system, the ICM-42, was made available by Honeywell . . . The BCS carried out a survey on computer aided production control.

LEASED LINES
E Series — A Wintree Tale
Once upon a time a little boy ran through the market place yelling "the E series is coming." Everybody was terrified and even the fire engine turned out. But it was a false alarm and the Policeman PC49 warned the Plus Ugly family that if their son, Magnus, did it again, they would be excommunicated, even flahled out.
Well he did it again, of course shouting "Chips to you!" and he had to be transported on the [illegible] in Saudi Arabia together with lots of brown envelopes.
The next day the Plug Uglies' daughter Ayesha ran screaming hysterically in font and nobody took any notice at all.
Then one of the E Series [illegible] came [illegible] into [illegible] through the market place, so [illegible] until it came to the house of User, where it stopped, breathing Contracts and Purchase/Rental Races. There was much wailing and gnashing of teeth and the inhabitants of the town ran and jumped into the Dead Sea together with Missco and for all I know they are still in the warehouse.
The Moral of this story is: if you want to obtain unbiased advice about the new IBM [illegible] come to us. We have no vested interest, no obsolete portfolio of high priced 370 equipment, only opportunities to buy on your behalf.
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FOCUS

DPM's future indefinite

IT did not require posters, wall or otherwise, to proclaim last years' message that "the future for DP management was bleak". Writing on the installation walls strongly suggested that the demise of the DPM was imminent and possibly long overdue.

In the past, the DPM has staved off many marauding aggressors. The company accountant or secretary were early plunderers as were keen computer salesmen. Consultants then had a go at usurping the DPM's role, closely followed by facilities management and turnkey operators. Also to be found beating on the installation door were large-scale service bureaux and software houses. Each and every assailant presented a competitive and persistent challenge.

This year, it could well be the year of the user. Minis and micros are now becoming standard features of many user departments, with software packages being available "off-the-shelf". In many other areas, computer systems are being distributed far and wide — at least as for as the Post Office modem will permit.

The gloom and doom theme was further hammered home at a recent IDPM Central London branch meeting. The guest speaker was Alan King management services manager of Lyons Maid, a noted knocker of DP professionals. Apparently, it is not sufficient for the DPM to be skilled in DP systems and programming. Such talents are as out of touch as the lease taken out on last year's IBM equipment.

Far better, according to King, for the DPM to embrace such skills in management as organisation and methods, work study and corporate planning. In fact, data processing management should be T-shaped, the bar across the top representing project skills while the stem indicates in-depth expertise in company and business disciplines.

This revelation rather shook those DPMs present who misguidedly believed that they already had a fair grasp of these particular skills. Similarly, the claim that only management services can originate change, initiate improvement and mastermind implementation.

Not so long ago Ron Yearsley, director of BIS, wrote (CW, October 19, 1978) that in his view, the DPM was dinosaur shaped and his days were very definitely numbered. This particular count-down, it seems, was well advanced with many industry commentators confidently awaiting the final knock-out blow.

Whether 1979 will see the DPM down and out is, one hopes, doubtful. Computer suppliers are forecasting a bumper sales year, and vacancies — if the back pages of CW are any guide — are at an all-time high in the computer industry.

1984 and all that . . . .

COMPUTERS and "silicone" chips are the latest fashionable talking point for pundits, public figures, national and provincial Press and broadcasting and the talk is often very silly indeed.

Contributions from readers are welcome — we will pay £5 for each howler that we print.

Computers now spend more time on the phone each day than any human telephone addict — deciding such vital questions as how to spread electric power loads, when to open reservoir flood gates . . . and how much dried milk to put in the latest brand of ice-cream!

So next time you get a phone conversation interrupted by what sounds like electronic machine-gun fire, don't automatically blame the telephone service.

You just could be eavesdropping on two computers deciding your future . . .

Luton Evening Post Echo

LORD PEART TELLS OF REAL CHALLENGE FROM INFORMATION TECHNOLOGY

Non-use is greatest threat, BCS 79 told

THE failure to use information technology to increase the UK's economic and industrial competitiveness poses a far greater threat to employment than the possible increase in unemployment caused by use of the technology, according to the Lord Privy Seal, Lord Peart, and Duncan Davies, the chief scientist and engineer in the Department of Industry.

This view, expressed during the BCS 79 opening day, characterised the cautiously optimistic tone which pervaded the BCS 79 talks and discussions on the impact of information technology in general and microelectronics in particular.

And in his BCS lecture (see page 2 and right) Murray Laver concluded: "Our generally negative public attitude to computing suggests that we have lost our nerve.

"We need to recover the verve of the Victorians without their brashness and, in the immortal words of Star Trek, 'To boldly go where no man has gone before,' namely to the future."

In the keynote speech which opened the conference, Lord Peart, said that, although fears had been expressed that the new technology would simply create unemployment, the government now accepted the "far calmer, but not complacent view" of its Central Policy Review Staff "Think Tank" report (CW, December 14).

"The major factor affecting employment," Lord Peart said, "will be our competitiveness in supplying products incorporating the new technology. If we adopt this technology as fast as, and preferably faster than, our international competitors, the number of jobs created will outweigh any job losses from increased efficiency.

"The one sure recipe for rising unemployment will be to respond too slowly." However, he accepted that "there will be transitional difficulties in adapting to the new technology. Some jobs will disappear, perhaps faster than can be dealt with by natural wastage.

"Some skills will be replaced by others and there will be a need for mobility and flexibility in taking up new jobs. Action will be needed to ensure that individuals do not suffer avoidable hardships.

"The government has an obligation to ease these transitional difficulties as far as possible. Part of the solution lies in training and retraining. If, in addition, special employment measures are needed, they will be taken."

Lord Peart is chairman of the Advisory Council for Applied Research and Development which has set up three working parties to look at the applications of semiconductor technology, technology-based industrial innovation and the employment consequences of technological change.

Lord Peart's theme was developed by Duncan Davies during a session organised by the British chapter of the ACM which tried to examine some of the positive options opened to society by information technology.

As he was ill, Davies' speech was read by his deputy at the Department of Industry, Ian Lawrenson.

Davies' main point was that not only did new technology create new jobs — he said there were about 700,000 jobs created in California's Silicon Valley — but that the increases in unemployment resulting from automation could come much more gradually than that foreseen by the more gloomy forecasters.

He believed the two examples most frequently quoted to illustrate the dramatic employment impact of micros — the destruction of the traditional watch and calculator makers — had certain unique characteristics which meant they could be untypical.

Watches were characterised by the fact they had one simple function to perform, so that it was simple to create a reliable new mass product very quickly.

The difficulties of reliably and predictably engineering more complex control systems and software would, however, greatly lengthen the "substitution" timescale for other products.

Calculators, he explained, were complex devices but most of them were bought because they were so cheap. People believed they ought to be useful but very few calculator users made — or needed to make — full use of the device's capabilities.

CW Editor Malcolm Peltu with a group of students.

'Great' say students

"WE think it's great — particularly the careers lectures." That was the verdict on the BCS 79 Young Computing Fun Fair by a group of students (left) from Emmbrook school in Woking, when asked by Computer Weekly editor Malcolm Peltu (right) for their reaction to the first ever computing event designed specifically for children.

The 3,820 other young people who thronged the event seemed to generally agree with the view that the serious lectures on computers and computer careers made the visit particularly worthwhile.

The Fun Fair exhibition included "high street" stands designed to display the use of computers in everyday situations, ranging from an estate agent to a toy and hobby shop.

In a far-sighted and adventurous public relations exercise, the police put on a demonstration every half-hour to show how the Police National Computer system operates in assisting the police force.

'Software is troublesome stuff'—Laver

THE "troublesome stuff that is software" and the "primitiveness of systems analysis techniques" were emphasised during BCS 79 as potential brakes on the advance of information technology.

The Department of Industry's chief scientist, Duncan Davies, said that, although the low cost and flexibility of the micro had removed some of the "technical limits" to the increased use of information technology, they would also "expose" the primitiveness of available systems engineering techniques when micros are introduced into control systems more complex than calculators.

And in the first BCS annual lecture, Murray Laver, former member of the Post Office Board and, in retirement, a visiting professor at Newcastle University, said, "Should a computer fail to please, it is worth recalling that its programmers have had the major effect on the quality of service it can give."

However, he said, "Software is troublesome stuff. It is almost intrinsically pure labour, and wage costs continue to rise."

'Plan now for leisure'

"IF work was a good thing, the rich would have found ways of keeping it to themselves," was a Haitian proverb quoted by ASTMS research director Barrie Sherman during the BCS 79 session examining future options opened up to society by information technology.

Sherman used the proverb to illustrate his thesis that the "work ethic" was not necessarily an unchanging law of human nature, and that the only way to avoid a dangerously violent reaction to changing patterns of employment caused by new technology would be to plan now for a society in which the right to leisure and "sane" living is given as high a priority as is the right to work at present.

Intel boss on why UK could face brain drain

THE acknowledged skill of British software and applications experts, coupled with the generally low level of reward and status attributed to these people in the UK, could well lead to a new and potentially damaging "brain drain", according to Howard Kornstein, of Intel UK.

This was spelled out at the session on the UK's role in microelectronics at BCS 79. Kornstein was outlining several areas in which the UK could participate constructively in the future development and application of microelectronics.

These, he said, ranged from chip manufacture, with the attendant high risk to the capital involved, to the manufacture of the end products that make use of the technology. An integral part of this latter area, according to Kornstein, is the UK's skill in providing software and systems design services.

He pointed to West Germany as a major headhunter of UK brain power, emphasising several inter-related factors. These included the superior status and salary earned by engineers in that country, the potential demand for the products they could produce, and the even greater lack of indigenous skills than in the UK.

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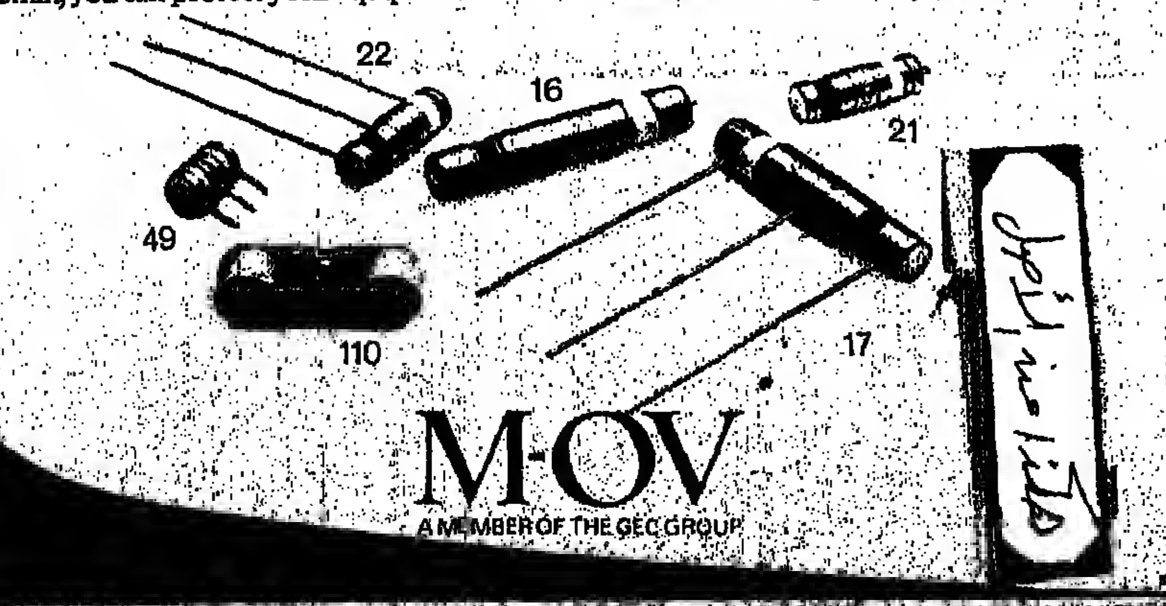

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Downtime

Soothsaying Teddy Bears

OUR Artificial Intelligence guru, Professor Donald Michie, has just returned from the US with news of the latest application there of microprocessor technology — the Executive Teddy Bear. This provides flattery on demand, by means of a voice synthesiser.

The harassed executive presses its belly button and out comes a random selection of soothing phrases from its digital memory — "You're wonderful ... You're the Tops ... Steve McQueen watch out" — and so on. Apparently the technology is so advanced now that one or two thousand phrases can be stored easily.

Leading on from this, Michie is certain that the next development in micro-controlled consumer products is going to be in sex. Now that we've had computer games, he says, we must shortly be seeing the Intelligent Sex Toy. After all, if a micro can provide verbal flattery, why not physical flattery as well? Something along the lines of a micro-controlled life-size inflatable rubber doll — how does that grab you?

Don't ask me how this would actually work, but I'm sure some backroom boys will come up with something soon. The ingenuity of capitalists when faced with a money-spinning idea knows no bounds.

And remember, we're always being told that it is the applications of micros, rather than their manufacture, that is important for Britain, so I trust the MAP people are beavering away on this, as I'm sure they are at Grimbledon Down. At last, something for Britain to lead the world in!

Mind you, it gives a whole new significance to bugs in the software.

"We've made this one more human — it's got B.O.!"

Serpentine logic

A READER has sent me this rather sad story:

A Russian friend has spent many years in this country but still finds the language difficult. He also makes the study of computers his hobby and prides himself on the speed with which he can solve problems.

Last year he took his sons to the Schoolboys Exhibition, where they saw a computer on display. "Solve a problem in less than 80 seconds and win a Pet," said the notice on the stand.

Thinking how wonderful it would be to own a Pet computer, Ivan set to work and solved the problem in less than 60 seconds, a record for the day. "Right, now which pet would you like — a canary or a grass snake?" asked the demonstrator.

"It would have cost me at least £3 to house the canary properly," said our friend later. "I did the only thing possible, chose the grass snake and raffled it".

In the know

YOU may think privacy is a crashing bore, but I will have you know that when the Canadian Human Rights Commission advertised for staff, they got 8,000 applications. Of these, 2,000 wanted to be privacy inspectors. The Commission has been seriously held up in getting down to its job by having to sift through all these applications. Is it cattish of me to suggest that some of these people may be interested in privacy because they have a teeny weeny inclination to find out about other people's private affairs?

● JOHN EDWARDS of Bishops Stortford writes pointing out that a firm called Agricultural Database Ltd is advertising in Computer Weekly for a sales manager. He wonders whether the database software they use is System Arr?

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The role of the PR profession

Neither liars nor censors

IT was a bitterly cold autumn night. The witching hour was approaching, and my last meal was a distant memory. I was standing with a group of other similarly cold and starving journalists outside a shut and deserted Venice airport, waiting for the river taxi which the public relations man had promised was on its way.

It took about an hour for the taxi to arrive. At the end of that time, morale was very low indeed; feelings about the poor individual responsible for the delay were correspondingly running very high.

It would have taken a very brave or a very stupid man to have canvassed the assembled multitude for an opinion of the Public Relations profession.

The moral of this story is that one should never ask a journalist for a considered opinion of PR people. Flak is likely to fly. One intrepid PR man has, however, asked me to do just that, and my editor thinks it a good idea.

So I'm going to make the attempt.

For the purpose of this article, I shall restrict discussion of the PR executive's role to the question of Press relations. Much of what I shall say nonetheless applies to public relations in general.

What does the PR function involve? For many, PR conjures up a vision of some kind of drunken lout (no sex discrimination intended; I just can't think of a suitable female alternative to lout) whose lot in life is to tell lies about the organisation he represents.

For others, perhaps prospective employers of PR expertise, the view is of somebody who — by exercise of charm, willpower and if necessary some form of direct or indirect bribery — will exert tight control over what the Press says about the organisation in question.

Both points of view are gross distortions. The PR profession has an important role, in which dishonesty and corruption seldom play a part. A good PR person performs a valuable service for his organisation, for the Press, and for the community in which he works in general.

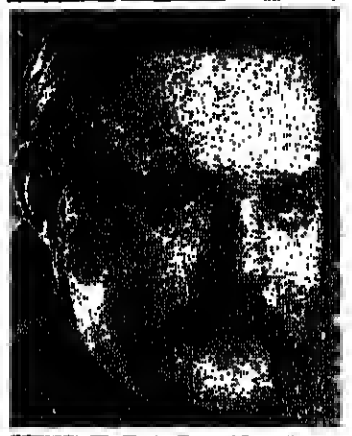
That may sound like a piece of PR in itself. In fact it is not; I have never been a PR man, and have no idea what the Institute of Public Relations has to say about the profession it represents. What I have to say derives solely from my experience as a journalist.

PR should properly be regarded as a sales support activity. PR executives require much the same quality as sales executives, but whereas the salesman is selling to individual customers, the PR man does so to the world at large.

For any company, it is no use having the best product in the world if nobody knows about it. Salesmen can, of course, be employed to spread the word, but they are restricted to doing so to one person at a time. And in today's highly competitive business environment, that just is not good enough.

The PR man makes sure that the message does get across. He acts as the official voice of the company in telling the Press that the product has been launched and in defining its capabilities, qualities and virtues. He helps to ensure that journalists covering the launch get all the information they want, and puts them in touch with the various technical experts within his organisation.

There are two common ways of doing this. One is the Press release — that is, an announcement by post. For most products this is the most effective method. But for some which are of more than usual interest, a Press conference is arranged. This is much more expensive, and from a journalist's point of view much more time-consuming, but if the product is particularly technically innovative, or represents an important advance for a large number of computer users, then the extra investment can be well worthwhile.



By Nicholas Enticknap

Drunken liars or charming controllers of the media? Public relations people are neither, explains NICHOLAS ENTICKNAP, who examines the true role of the PR profession in serving the public, the communications industry and the companies represented.

The computer industry is so dominated by rapid technological advance that new products form a large proportion of the news that most computer users need to know. But the PR person's responsibilities are not just confined to promoting new products.

He is concerned in the widest sense with informing the world all about his company and what it does. This includes news of other company activities, such as plans for building new factories, financial results, and changes of personnel.

To do this effectively, he must be well acquainted with all the media which might be interested in his organisation or its products. Every reader will know that each national newspaper is different; they appeal to different readerships, concentrate on different subjects, and write their stories in different ways.

The same applies to the trade Press. Computer Weekly is different from Computing, both in the topics it covers and in the way it covers them. The two papers have different editorial policies, despite the fact that they are appealing largely to the same readership.

And this is not merely of academic interest. Most readers will be unaware of the thinking which underlies editorial policy, but they will be affected by it nonetheless. They will find they prefer one paper to the other, find one of them very informative and the other a good read on the train.

If one looks at the monthly publications, the differences are even greater. Data Processing and Systems, for example, differ not just in content and style, but in the readership they are appealing to, as well.

All this information is essential to a Press officer. If he has a news story of interest, or an article for publication, it may well be most suited to one particular publication. With some news stories, it can be more desirable to achieve a lot of coverage in one publication, and none in the others, rather than a brief mention in perhaps three or four of them.

With articles, the more appropriately they are placed the more likely they are to be read and appreciated. Specialist knowledge can therefore greatly improve both the quantity and the quality of coverage an organisation gets.

Over a period, a PR person will build up a relationship of trust with the editors and journalists on the various relevant publications. The ability to do this is an important part of his expertise.

The element of trust is crucial: the PR man has to know to whom he can reveal information in confidence, and the journalist has to know how much weight he can place on what he has been told.

It can sometimes go further than that. I remember once when a colleague uncovered an important exclusive news story, and as a matter of routine checked it out with the mainframe manufacturer concerned. This company's Press officer then leaked the story in a rival publication.

Now that, from a journalist's point of view, is one of the ultimate crimes.

Action was taken. For some months afterwards, stories concerning that manufacturer were not checked with the Press officer. This made no difference to the accuracy of the stories (other means of checking the facts were adopted). It did mean that the manufacturer's point of view did not get a hearing (and a chance to influence the formulation of the report) until the following week, if then.

As well as making positive efforts to disseminate information, the PR man is involved in responding to queries from outside his organisation, especially from the Press. This involves putting enquirers in touch with the appropriate person, ensuring that people get the correct information (not just the truth, but the whole truth), and, in the case of contentious stories, that they are put fully in the picture about the company's view.

This leads me to another cardinal offence: failure to return a call after promising to do so. It is tempting for a Press officer to do this as the easy way out of a tricky question. But it is counter-productive. One mainframe manufacturer is infamous in journalistic circles for this — and I believe it is no coincidence that that manufacturer feels aggrieved about the quality of Press coverage.

There are people who regard the PR man's role here as purely negative, that of preventing adverse stories from getting published. This is not the case. PR people have no such power. It is the journalist's responsibility to decide the strength of a story and the shape of a story, and the editor's to decide whether it should be published. The PR person is responsible only for ensuring that the journalist is fully informed.

Management's attitude to PR does, of course, have a big impact on the quality of the results achieved. To get the best out of PR, it is essential that the PR man be well informed about all the company's activities, not just those which management wants publicised.

The best way of achieving this is to place responsibility for PR with a top level executive such as the marketing director.

As an aside, I have found that many companies are afraid of "unfavourable" stories appearing about them in the Press, to the extent even of wishing to make minor changes in phraseology. In my experience, this sensitivity is totally unnecessary. Stories of criminal negligence, malpractice and fraud are obviously to be avoided; but, in general, any publicity is good publicity.

With all this activity, a good PR man can make a significant contribution to his company's success. This contribution cannot easily be measured; some companies attempt to do so by, for example, counting the numbers of newspaper stories that mention them, but except in special cases, such as a new company trying to establish itself, it is not a very helpful thing to do.

Measurable or not, there is no doubt that PR can be and is of great value to many computing companies.

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MBE for man who pioneered training of blind programmers

BEHIND the announcement of the New year's Honours award of the MBE to Geoffrey Bull, of BP Oil, lies a considerable story of work for the community and for his colleagues. Geoff, who has been blind from an early age, joined Shell-Mex BP, as it was then, in 1967 after taking part in the first course to train blind people to be programmers (CW, March 23, 1997). He joined the company, which was the marketing operation for Shell and BP, at its Hemel Hempstead Computer and Accounting Centre, and when the organisation was split up he remained with BP Oil.

Geoff has been a project leader for some time and is now part of a team working on the development of a management information system. He is also a staff representative on the company's pension fund consultative council and on the board of BP Oil Trustees Ltd, which administers the fund.

A member of the executive council of the Royal National Institute for the Blind, Geoff is a keen sportsman and has taken a leading part in developing sporting facilities for the blind and disabled. He is also on the executive council of the British Sports Association for the Disabled and last year was chairman of the British Association for Sports and Recreational Activities for the Blind.

Shell Mex was one of the first companies to take part in the scheme to train and provide jobs for blind programmers and at Hemel Geoff has two blind colleagues, Gerald Alner, who was with him on the first course, and John Farley. They are both senior programmers.

GCS to market Quantel in the UK

BACKED up by a large and well established maintenance force located all over the country, General Computer Systems has introduced the Quantel family of small business computers to the UK market. Built by the Quantel Corp of Hayward, California, more than 2,000 of the systems have been sold over the last four years, mainly in the US.

The Quantel family consists of three ranges of modular systems, the 200, 900 and 1400 series, which are compatible in both hardware and software terms. The smallest 200 machine comes with a 48K byte processor and 1.3 million characters of floppy disc storage, while the biggest 1400 system can have a one Megabyte main memory, 600 Megabytes of disc storage and up to 64 display terminals.

On the software side, products available with all the Quantel systems include Qicbasic which is described as an English-derivative, high-level language specially designed to permit easy development of complex interactive business applications. Qicbasic is supported by Program Generator which can automatically generate Qicbasic coding from definitions of the system design.

There is also a package called Report generator for interactive inquiry and report printing and a range of applications packages, called Solutions, developed jointly by Quantel and GCS in the UK for jobs like order processing, inventory control and accounting.

The interactive operating system provided with all Quantel models is called BEST, Business Executive System for Timesharing.

GCS is the UK subsidiary of the Dallas, Texas based firm which is now part of the Telex Corp. GCS is best known as the manufacturer of the 2100 series of key-to-disc systems but is now active in the shared processor text editing market with its Datatext systems.

GCS kit used to be sold in the UK by Interscan, and a large number of Interscan staff joined GCS UK when it was set up after Interscan stopped trading. GCS UK says that it has more than 70 service engineers.

The Quantel Corp was founded in 1969 but was completely reorganised in 1975 when Douglas Baker, one of the founder members of the Basic/Four organisation, took over as president and implemented a policy of marketing through distributors.

In the UK GCS plans to appoint sub-distributors to handle first-time user sales.

Taking on the Russians

A BRAVE man is Peter Ellis, deputy managing director of ICL, as he takes on Russian Grandmaster Evgeny Vasyukov at the opening ceremony of the 54th Hastings International Chess Congress. ICL is sponsoring the congress, which had run into financial difficulties.

Our picture shows Ellis seated on the left. Looking on in the background are another Russian Grandmaster, Alexander Kochiev (left) and Ritson Morry, chief controller of the tournament.

Ellis said of ICL's involvement, "Our interest stems from the fact that chess demands the same skills and logical thought that are required in many aspects of our computer business."

Indian college wants DAP

● From front page

gave me another Rs 5 million contract.

"They want us to write some management games, and also a chess and a noughts and crosses program; ICL and IBM have these, and so they feel that they have to have them too!

"There is Rs 1 million still outstanding on the original contract, and they wanted us to take another computer; however they have agreed to pay the balance in cash.

"We need modern hardware such as the 2976, because we are moving on to database, real time and communications applications. We do not want another Russian computer, although we may exchange our 1030 for the new virtual 1033, which is somewhere between a 370/125 and 135 in power. But our medium-term aim is to get a modern Western machine."

During his talks, which also took in the National Computing Centre in Manchester, Dr Banerjee also discussed student exchanges of between three and six months.

"The British students would get experience of working on real Third World projects such as our GURU General Education and Utility Education Resource Unit; a travelling school for adult education in things like the use of fertilisers and pesticides. And our students would benefit from a spell working at the frontiers of knowledge."

Chinese place $69 million contract for Cyber 170s

THE biggest computer contract yet placed by the Chinese government has been awarded to Control Data. Worth $69 million, it is for a dozen low-end models in CDC's large-scale Cyber 170 line and is subject to CoCom approval. The Cyber 170s are wanted for geophysical exploration, and will join two Cyber 172s already installed.

The contract includes additional memory and peripherals for these two machines. Software is to be supplied not by CDC but by Compagnie Générale de Géophysique of France, underlining the close relationship recently established between China and France on computers.

Univac view of the 1980s

UNIVAC managing director Bill Read will present the company's view of Computing in the 1980s at the Waldorf Hotel, Aldwych next Thursday, January 18.

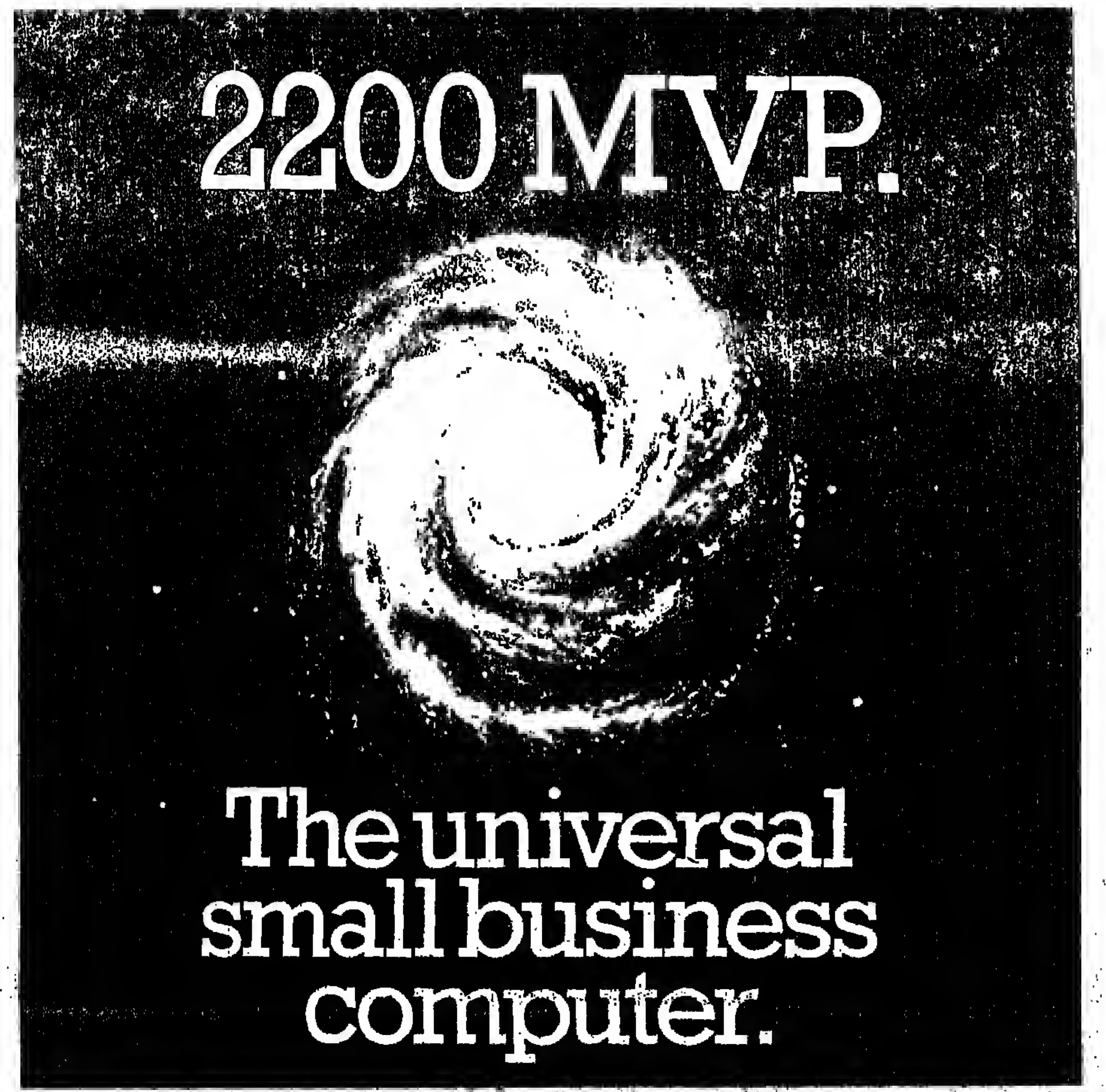
The British Computer Society London branch will hear Read's views on the effects of advancing technology, the response of users, and the pressure that plug-compatible manufacturers are increasingly exerting on large mainframe manufacturers.

The meeting, which starts at 6 pm, is open to non-members.

GTE to acquire Telenet for $59m

COMMERCIAL packet services pioneer Telenet Corp, the company which will supply the hardware for the UK Post Office's PSS Packet-Switched Service (CW, November 30), is to be acquired by GTE. The deal, already foreshadowed (CW, October 5), has now been confirmed by GTE; the bid, in GTE shares, values Telenet at about $59 million.

Telenet is a so-called "value-added" carrier, leasing lines from telephone companies, principally AT&T, and offering high-level packet-switched services to customers. GTE is a diversified communications and electronics company and the second-largest US telephone service company after AT&T. The acquisition would enable GTE to compete with AT&T's planned ACS Advanced Communications Service, formerly known as the Bell Data Network.



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Wang would not be where it is today if it still made desk top calculators rather than computers. Consistently one of America's top ten fastest growing companies Wang now boasts the second largest installed base of small business systems in North America.

Wang's 2200 series of computers covers 80% of the market's needs and the MVP is one of the latest processors in this series.

The multi-programming 2200MVP supports up to eight terminals and can offer 256 Kbytes of main memory and 80 Mbytes of disc storage. It can communicate as part of a network and with most mainframes, and like all Wang computers it allows easy expansion.

Find out about the 2200 series and its potential for your applications. There could be much more happening out there than you ever imagined.

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هكذا من الأصل

MICHIE'S PRIVATEVIEW

It's like buying a Rolls-Royce for a fiver!

FOUR years have elapsed since the facts set out in the table below were put together. During that time the microprocessor revolution has shown no sign of slowing — rather the reverse.

One way of expressing the cumulative magnitude of what has happened since the early days is to ask what would be equivalent cost and performance changes in the world of motoring. The answer could be phrased this way: In 1953 you buy a Rolls Royce for £7,500, with a top speed of 150 miles per hour and an average gasoline millisation of 10 miles to the gallon. In 1974 you are offered one with a top speed of 15,000 miles per hour and capable of 649 miles to the gallon; the price is £7.50: in 1978 the model shows further improvements and the price has sunk below a fiver!

UNIVAC
1953
FIRST COMMERCIALLY AVAILABLE LARGE SCALE COMPUTER
5,000 VACUUM TUBES)
$750,000
2,000 INSTRUCTIONS PER SECOND
1,000 WORD MEMORY — MERCURY COLUMN
525 MICROSECOND FIXED ADD TIME
SIZE. 16,686 LBS., 18 x 22 FT.

INTEL 8080
1974
MOST WIDELY USED MICROPROCESSOR TODAY
$750
200,000 INSTRUCTIONS PER SECOND
UP TO 64,000 WORD MEMORY
2 MICROSECOND REGISTER ADD TIME
SIZE: 16 LBS., 1×1 FT.

Consequences of all this range from the sublime to the ridiculous. Let us start with the latter.

Spectrum: Computer's Amazing Micro-Mouse Maze contest recently completed its third cycle. In deference to the feelings both of semiconductor freaks and of mouse fanciers, a veil should perhaps be drawn over contest No 2, won by Earl Kalbfleisch's Charlotte, described as "sporting ears, a tail, and a pair of long black eyelashes." The cause for reticence is that this Intel-8748-guided device was the sole *working* micro-entry of the ten.

That was in August. In September, under the auspices of Wescon, at Los Angeles, ten hopefuls again entered. Seven flunked, the commonest complaint being that optical sensors had suffered disarray from the bright Californian sunlight.

Of the survivors, Wallbanger romped home, the creation of Gary Sasaki, Kenneth MacLeod and Gary Gordon of Hewlett-Packard, Santa Clara. Wallbanger's three runs were timed at 41, 41 and 42 seconds, far eclipsing Charlotte, who was runner-up with a best time of 2 minutes 17 seconds. Wallbanger's secret is "no frills, no optics, no heuristics" — just a fixed propensity to bang along the right wall at the highest possible speed. This corresponds, of course, to a "depth-first" exhaustive search of the maze, a provably complete strategy.

The fault for such boring behaviours lies not with the Micro-Mice and their intrepid inventors, but with the organisers. So small a step is needed to transform the Micro-Mouse scene into one of cognitive richness and challenge! Simply requiring that the contestant should run back again through the maze to the start would significantly raise the level. The Micro-Mouse able to use rote-memory combined with dead reckoning would immediately score against Wallbangers pure and simple.

Beyond lie many inviting elaborations. For example, let the maze terminate in an expanded area in which nine pins have been placed. The Micro-Mouse on arrival must gather these simple objects and bulldoze them back through the maze to the start, exploiting, as it chooses, touch, vision, acoustics, laser range-finding, memory of the maze already traversed, and strategies not only for pushing but also for detecting and retrieving stragglers which slip off the Micro-Mouse's shover, bucket, clamp, claw, tentacle or whatever. Just one snag: the obvious potential usefulness of successful solutions, for example in baggage retrieval in airports, rubbish collection after football matches, etc may spoil the careless rapture of the amazing Micro-Mouse world.

The figures tabulated earlier and also the Micro-Mice themselves give a misleading emphasis in one important respect. The most remarkable developments of all are concerned with the costs not of processing but of storage. IBM has announced semiconductor memory available by late 1979 in ¼ Megabyte modules for $4,500 per module. Rumour tells of a 4,000-Megabyte disc shortly to be announced. Trillion-bit ROMs are already in existence, and Lawrence Livermore Radiation Laboratories are now issuing specs which call for this to be pushed up by a factor of several thousand.

These trends may portend a total revolution in the way we should be shaping problem-solving systems for tomorrow's world. Some of the possible consequences of availability of large cheap memories for the way we go about things will be considered in a future Privateview.

Donald Michie

Telesoftware uses object code and micro

A SPECIFICATION for telesoftware currently being finalised has been proposed as an international standard by its author, W. J. G. Overington.

Said to be compatible with the UK specification for broadcast teletext, the specification is based on object code transmission and uses the instruction set of a novel microprocessor, designated the 1456.

Puzzler

IF the digits 1 to 9 are used once each to form a number of primes, the smallest "prime-sum" that can be achieved is 217 — made up of 2 + 5 + 7 + 43 + 61 + 89.

This week's problem is to find the smallest possible prime-sum where all ten digits, from 0 to 9, are employed once each. See page 69 for solution.

According to Overington, his specification is aimed explicitly at giving terminal designers maximum freedom.

It will be suitable, he says, for large-scale manufacturing operations yet also takes care to provide for the hobbyist with limited facilities. In addition, any person or company that wants to will be allowed to manufacture equipment to obey 1456 software.

Explaining why he favours object code transmission and a new microprocessor over use of a high level language, Overington said, "I believe that the use of a high level language as a standard, to allow usage of any microprocessor, would be a mistake.

"I suggest that, in practice, the market would polarise into use of but a few microprocessors. The positive benefits of using object code — namely speed, flexibility, and compactness of transmission — would have been sacrificed for short term compromise."

He added that his design for the 1456 was specifically oriented to telesoftware and teletext applications.

Overington, who claims to have invented both the concept and the word telesoftware back in 1974, offers a definition of telesoftware as:

"The concept of producing a remote access computer system by means of the unidirectional cyclic broadcasting of software and its selective use by an unlimited number of independent terminals, each having its own processing element and each characterized by a reception only telecommunications facility."

A spokesman for CAP, which uses Telesoftware as the name for its viewdata terminal programs, most of which are written in MicroCobol, welcomed the idea of an international standard.

He regarded the effort, though, as somewhat premature. "Everything is still pretty flexible," he said, "so that there are one or two things to be sorted out before a standard can be set. One example, for instance, is the difference between the French and UK viewdata character sets."

SOFTWARE FILE-1

IBM plan provides for 'a timely exchange of information' in US

IBM's data processing division has extended an invitation to US software companies to take part in a Software Information Exchange Programme. Announced at a recent conference of the Association of Data Processing Service Organisations (Adapso), the programme was billed by an IBM spokesman as one which will provide for "a timely exchange of publicly available information relating to software products."

Speaking to Adapso's Software Industry Association (SIA), Edward J. Kane, director of industry relations for IBM's Data Processing Division, explained, "This would be a reciprocal programme, and member SIA firms would exchange publicly available information regarding the announcement and availability of software products with all participants."

Kane added: "IBM's participation would be governed by specific guidelines that would be sent to interested firms on request." He explained that IBM would provide announcement and availability notices to all participating companies and that "selected optional material" would be forwarded on request.

"Other publicly available information that might be required would continue to be available from the local IBM office at the established charge," Kane said.

Jerry Dreyer, Adapso's executive vice-president, commented: "The opportunity for co-operative exchanges between IBM and member software companies would prove beneficial to the participants as well as to the entire computer services industry."

The programme is expected to start early this year.

Q-Pac support is strongly approved by users' association

THE restructuring of support for the payroll package Q-Pac which gave Q-Pac Services responsibility for maintenance and service in the UK (Software File, May 25, 1978) has been received enthusiastically by the 60-strong UK user association.

Q-Pac Services took over support for the package at the beginning of October last year. Since then it has made an all-out effort to help users get more from the system, according to the user association's chairman, K. M. Sherborne of Chloride Lorival.

One of its major activities has been user training. Some 150 people have attended formal courses, while many others have had "across the desk" training.

"This has highlighted the fact that users were unaware of the power and flexibility of the package, and as a result were not using it to its full potential," noted Sherborne. "Many user written programs and manual systems have merely duplicated functions available as standard Q-Pac facilities."

Armed with the new information, he said, many users would change their systems to make use of the software's capabilities.

"The association feels that the package has far more potential and greater flexibility than was previously realised. If Q-Pac's service and knowledge continues to be disseminated, many UK installations will be extremely happy with the system."

In addition to demonstrating the versatility of the system, Q-Pac Services has also helped users to improve performance.

"Q-Pac has always been considered to be a slow system as far as computer time is concerned. However, techniques have been pointed out for increasing throughput speed without in any way detracting from the power of the system. Some people are already talking about increases in throughput speed without in any way detracting from the power of the system. Some people are already talking about increases in throughput of around 30%."

Developed in South Africa, and sold here by Package Programs Ltd, Q-Pac has over 100 UK users in all. A new and more powerful release of the software is currently under test and should come into general use shortly.

Sharp puts APL on telex

SIGNIFICANTLY extending the accessibility of its service worldwide, the APL time sharing company I. P. Sharp has completed work that enables users to run APL interactively via the public telex network.

The new facility is intended particularly for data entry to an existing APL application and is also suitable for a limited amount of report printing.

Sites such as branch offices which already have telex equipment can thus participate in an APL data processing system without the expense of acquiring a special APL terminal, and a modem or acoustic coupler.

Telex access can also offer economies to users not yet within local call range of the Sharp network, where telex charges are less than long-distance call rates.

Sharp provides two telex nodes, one in Amsterdam and the other in Rochester, New York. Both are already being used by major multinational Sharp customers to enter data directly from branches in Africa, India, and South America.

Telex is not recommended for APL program development, however, principally because telex terminals do not handle the special APL characters.

Sharp notes that the completely interactive access given by the system distinguishes it from other APL telex facilities. Terminal users have direct control of their programs, and, in data entry applications, can validate input data online.

The system can also be used in offline modes, though.

Most telex terminals have paper tape reader/punch fittings so that telex connection can provide a simple means of transferring APL output to punched paper tape.

HTFS available from SIA

EXTENDING its chemical engineering library, SIA has installed the full range of programs developed by the Heat Transfer and Fluid Flow Service (HTFS).

An extensive range of fully documented programs for equipment designs and performance investigation, the HTFS software runs in batch mode and can be accessed at SIA either in remote batch mode or in conversational RJE.

Some of the programs are directly interfaced to the Institution of Chemical Engineer's physical property databank, which is also available on the SIA service.

Organisations wishing to use the software must first join HTFS, and will subsequently be charged just for computing resources used. The programs are supported both by SIA's chemical engineering group and HTFS staff at Harwell.

NAG Algol and Fortran from Computerline

ANOTHER major computer service bureau — Plessey's Computerline 1900 bureau at Weybridge — has installed the Numerical Algorithm Group's Algol 68 and Fortran Library.

The installation of the software is announced in the December issue of Computer Lines, the bureau's bi-monthly newsletter. The issue also contains an introduction to the bureau's statistical services.

Leasco-Stork subsidiary

A SUBSIDIARY in Holland has been set up by Leasco software in conjunction with Stork data, the computer services subsidiary of the Vmf-Stork group. The new company, S + L Data Systems, will offer services ranging from consultancy, through turnkey systems, to the sale of software packages.

SOFTWARE FILE -2

EDITED BY PETER HEWITT

Honeywell Level 62 service company

A NEW company, Datawell, is now providing software services for Honeywell Level 62 users. Datawell has signed an agreement with Honeywell under which the two firms will co-operate with each other throughout the UK.

Datawell is installing a Level 62 in a computer room provided by Honeywell at its Northern headquarters in Chendle Hulme, Cheshire.

The machine will be rented from Honeywell and will be used by Datwell for the development of software packages and tailor-made software, and also for software conversion. In addition, Datawell plans to run some conventional bureau work on the machine for outside clients — not necessarily Honeywell users.

Datawell has been set up by Alan Wilford and Bob Flint, who established Wilford Data Centre (Anglia) Ltd in Norwich in 1979, the bureau now known as Anglia Data Services. Alan Wilford also set up the Manchester-based data preparation bureau, Wilford Computer Services.

Bob Flint told Computer Weekly that Datawell was already carrying out work for one big client, Northern Engineering Industries, a Gateshead-based concern that is installing Level 62s at subsidiary companies all over the country. One of the subsidiaries is Thomas Smith of Rodley, near Leeds, a heavy engineering firm for which Datawell is converting ICL 1900 programs to run on Level 62. This process involves converting first to Level 64 coding, then to Level 62.

Honeywell itself now offers a set of conversion aids to Level 61/60 users upgrading to Level 62 (CW, November 9, 1978).

Cutting out the deadwood to streamline Cobol

A STUDY of a substantial sample of operational Cobol programs has shown that almost 85 per cent of executable statements are built round just five common Cobol verbs, while others are used so rarely that compiler support for them may be unjustified.

Conducted by the computer science department at Brunel University, the study used around 340 live programs donated by commercial organisations — close to ¼ million lines of Cobol code. The study findings were presented to the BCS 79 Living with Computing conference last week by Dr I. S. Torsun of Brunel.

In the programs analysed, MOVE was the most frequently occurring verb at 38 per cent of all statements. It was followed by IF (15 per cent), GO TO (14 per cent), PERFORM (11 per cent), and ADD (17 per cent).

Least commonly used were certain forms of DIVIDE, and DELETE and SEEK. Not one example of these turned up in the programs examined.

Among other findings of the study were a number of interesting statistics relating to practical Cobol usage, including:

- An average GO TO distance of 56 statements, split into forward branches (average jump 71 statements) and backward branches (average 28 statements).
- An average PERFORM distance of 236 statements, with an average 18 statements performed.
- 10 comment lines, 168 data names, 3.15 files, and 55 paragraphs in the average Cobol program — which contained 666 lines.
- 5.76 statements in the average paragraph, and 8 paregraphs in the average section.
- An average user-defined name length of 7.81 characters.
- A high proportion of unreferenced statement labels in many programs, amounting on average to almost 3 out of every 10.
- Very little use of complex conditional statements, with an IF being followed by ELSE only 13 times out of 100, and by a second IF only 6 times out of 100.

The study was undertaken, said Dr Torsun, with the primary aim of providing guidelines for the construction of a fast Cobol compiler.

Because of the shortage of typical Cobol programs in universities and colleges, he had written to about 200 commercial organisations to request samples. About 60 of these had replied and 25 had eventually given programs. Some 40 per cent of the sample had come from British Gas.

As a result of the analysis, the department had been able to construct a compiler that executed around five times faster than the fastest commercially available for its system.

To achieve this, some verbs had been omitted entirely and the syntax analyser and code generator had been slanted to favour the most frequently used language features.

Dr Torsun . . . study resulted in a Cobol compiler that executes five times faster than the fastest commercially available for its system.

The compiler, for example, was designed to respond very quickly to the five predominantly used verbs.

Within the scope of each verb further tuning had been undertaken, based on normal patterns of use. The most frequent data type after a MOVE, for example, had been found to be numeric, at 31 per cent followed by alphanumeric (20 per cent) and numeric literal (10 per cent).

An interesting aspect of the analysis was the extent to which the quantitative measurements made reflected underlying program quality.

Firms had been much more reluctant to supply the necessary live or test data for dynamic program analysis than they had been to provide source code for static analysis, he said. Nevertheless the team had been able to monitor the execution of some 22 of the sample programs.

For this purpose, each program was divided up into "basic blocks" consisting of a continuous code portion with just one entry and exit point.

Some 17 per cent of these blocks were never executed. While in many cases this was attributable to the data used for the test, in some cases the blocks had later been found to be logically inaccessible.

Further, 24 per cent of the blocks in the average program were executed just once while 5 per cent of the code was typically responsible for 50-60 per cent of the execution time.

When examined dynamically, the five predominantly used verbs accounted for over 96 per cent of the statements executed. Its use in iteration put IF at the top of the list, with 33 per cent, while the frequency of the others was MOVE — 27 per cent, GO TO — 11 per cent, ADD — 20 per cent, and PERFORM — 10 per cent.

Although the dynamic analyser generally added around 50 per cent to the execution time of a program, its usefulness in program optimisation and debugging had persuaded two very large organisations to adopt it for use in development work.

Although received with great interest by the conference delegates, Dr Torsun's presentation was treated with some scepticism by a number of those attending.

The chief objection raised was that most commercial Cobol work is I/O — rather than mill-time — bound. It was also remarked that some of the detailed findings, for example, the use of IF, would be considerably different for a sample of more modern programs using structured programming techniques, and Cobol 74 compilers.

PROGRAMMER NOTES

Proposed Fortran deletions

RECENT articles on likely developments in Fortran have prompted a reader to write in defence of some of the established features whose long-term future is uncertain.

A. P. Cranswick, from Plessey Semiconductors, addresses chiefly the subject of the proposed deletions from the language (CW, December 7, 1978). While these features are for the moment only scheduled for removal from the "core", Cranswick is apparently anxious that this will be the first step towards their complete disappearance.

He also raises the often overlooked point that a "bad" program can be written in any language and that education in the effective use of a language has a major role to play.

He writes: "Surely the objective of any language is that it enables effective communication between parties. In the case of programming languages, communication must be between people — for maintenance and extension; and between people and the computer — to enable the computer to obey the program. It is the first type of communication, the people to people communication, that causes most of the problems.

"I recently had cause to look at an Algol program of some 2,000 lines written with double density line spacing, virtually no comments and no formatting. In a case like this it is largely irrelevant whether a language is 'good' or 'bad'. Any program written in that manner is going to be difficult to follow.

"The enforced formatting of Fortran statements, and statement ordering, at least impose some discipline on the coder that gives some help to the reader of a Fortran program. Clarity of the program can be considerably enhanced by ensuring a numerical order for labels and identing DO loops beyond the normal formating.

"One would hope, in the case of the December 14 article (Software File, December 14, 1978), that a little knowledge is a dangerous thing, and that the facilities mentioned for possible extinction are to be replaced by other facilities. The EQUIVALENCE, COMMON, BLOCKDATA, Computed GOTO and Assigned GOTO can be used to structure a program effectively so that it is easy to follow and maintain.

"In fact, there seems to be very little literature indicating how Fortran facilities can be effectively used.

"The excellent implementation of Fortran by XDS (this implementation will now probably slowly die out) on the Sigma range of machines provided, I believe, a firm indication of the manner in which Fortran could be effectively extended.

"For instance, negative DO loops were allowed; IF statements could be followed by multiple statements on a line and were only processed if the IF statement was true.

"These are two simple but very powerful extensions, the latter eliminating a considerable number of GOTOs and labels. Other extensions, while apparently useful, could lead to a considerable lack of clarity in maintaining a program, for instance allowing Blockdats to be initialised in any routine.

"This is not an attempt to say that Fortran is superior to other programming languages, but that it is a very usable language, which could be improved like anything else, but which will not be improved by wholesale removal of some of the features which make it Fortran."

These are important observations which have considerable merit.

Anel has traditionally engaged in "trailing edge" standardisation and the appropriateness of its undertaking language development is open to question.

Yet very few users concern themselves over possible developments in the standard. If users fail to articulate their feelings on the future of Fortran now, they will have only themselves to blame if unwelcome proposals are eventually adopted.

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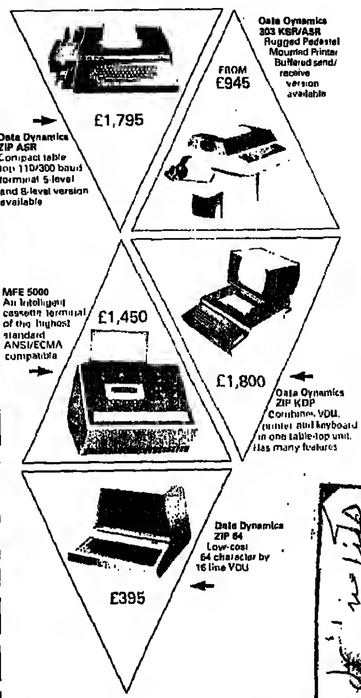

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OP SPOT

By Bernard Allen

In at the deep end—TOPS gives practical experience

Steve Ward

When Bernard Allen first interviewed Steve Ward and David Townsend, they were four weeks into a fifteen week long Training Opportunities Scheme (TOPS) operations course at Borehamwood College, in Herts.

Now, as they have just completed a three-week practical block and are at the end of their course, Bernard speaks to them again in order to discuss their progress.

AFTER some eleven weeks on the Training Opportunities Scheme's operations course at Borehamwood College, the students leave the security of the classroom and go out to various sites where they are thrust into the complicated, busy and often hectic environment that is computer operations.

They spend three weeks working with experienced operations staff, seeing what the job entails and learning how the operations department functions.

The work they do during this period depends, largely, on the size and nature of the jobs processed at the installation, and the staff of the site.

Both David Townsend and Steve Ward were extremely pleased with the practical training they had been given, as they told me when I visited Borehamwood College on the second-to-last day of their TOPS operations course.

Former golfer and lorry driver, David Townsend went to the First National Bank of Chicago in London. He obviously impressed the staff and management there for he was offered a position at the installation. He accepted and starts in January.

The site houses two IBM System 3 Model 15s, supports an online system with eighteen terminals, and also processes batch and testing work.

David admitted to being "lost at first," but buckled down and tried to make himself useful to the staff as well as adding to his knowledge.

"The supervisor explained that everything would seem rather strange at first — he was right. He gave me a manual and told me to watch how the operators work at the console."

During the first week David worked from 9 am to 5 pm. In the second week he was on the evening shift and during the third he did "earlies."

It was obvious that David gained a good appreciation of the problems which crop up in the day-to-day running of the operations department.

On one occasion, the decollator broke down at a very unfortunate time; it was late in the evening shift, and listings had to be dispatched in order to meet deadlines.

Said David, "I had to stay late and decollate a lot of output by hand. I didn't mind in the least, because the site hires cabs for the operations staff and I had no problems getting home."

David Townsend

David also learned about dealing with the problems of users online to the system.

He said, "It's important that online users are given a good service. A couple of times they contacted us to complain about their terminal being down. This problem arises if the units aren't powered-on at the time we start the TP program."

He also mentioned an occasion when one of the system discs became jammed as it was being loaded on to a drive. This brought to his attention the need to handle media and peripherals with respect. No machine time was lost on that occasion, he stressed.

David also spent some time in the data control section of the site, when the data controller was on sick leave.

Steve Ward was at the Bromley, Kent, site of the Seismograph Service for his three-week practical block. Like David Townsend, he spent the first week on days, from 9 am to 5 pm. Then he worked a twelve-hour shift system, "four days on, four days off."

Steve, who already has two years' operations experience, didn't have too many problems adjusting to the shift system, but nevertheless expressed his dislike of it.

He said, "When I was an operator at Seiscom Data's site in Sevenoaks, Kent, we worked a twelve-hour shift system. I have never liked it.

"In my view eight-hour shifts are much more practical and must be easier to get used to."

The Seismograph Service site has several different systems, and Steve operated an IBM 360/65, which runs under OS/MFT with Hasp, the Houston Automatic Spooling Program.

He said, "The OS operator commands are quite interesting, as they may be abbreviated in order to save the operator a lot of typing at the console. Hasp is a great help because it starts readers and writers automatically."

Like David Townsend, Steve said he was "rather lost at first," but by the third week he had grown in confidence and was able to run the console alone, for an hour or so at a time.

Steve said, "The operators at Seismograph took the trouble to explain some of the operator commands to me. This I found very helpful."

Steve has applied to four installations for a position in operations and has already received an offer from a site in Kent. But he hopes to join a company in Edgware, North London.

Steve and David are both pleased with the training they have been given by Derek Pinnock, who runs the TOPS operations course at Borehamwood College.

They also agree that the TOPS scheme should be given more publicity than it receives at present.

The READER procedure under IBM OS

IN past Op Spots I have given a broad description of IBM OS, considered the types of message issued by that system in order to communicate with the operator, and discussed the problems of main store, or core, fragmentation.

Now I would like to give further consideration to the READER procedure: that part of the operating system responsible for taking jobs from input devices and placing them on the input queues.

IBM OS will support up to three READER procedures at any one time. Each is assigned a physical unit, normally a card reader, but another device, such as a tape reader, may be used.

The command used to start the READER procedure has the following format:

S PROCNAME.IDENTIFIER, DEVICE ADDRESS

Installation standards will often dictate the exact command used by the operator in order to start the READER. At many sites it will not include an IDENTIFIER, and might be as follows:

S RDR,00C

In this case card reader unit 00C is assigned to a READER procedure called RDR. Once the procedure has been started it stays in main storage and may be used to place card input onto the job queues.

An IDENTIFIER is not included in the above example as they tend to be seldom used. However, they may be applied to good effect at installations where open shop testing is carried out. At such sites, one card reader will be assigned to live work and another to testing, allowing the programmers to input their own work to the system.

The following commands might be used to start the READERS:

S RDR.LIVE,00B
S RDR.TESTS,00C

When IDENTIFIERS are used in this manner, they provide the main console operator with extra information when he enters the OS DISPLAY command. This will help him ensure that the work schedule is kept to, and will aid the running and co-ordination of the department.

And when it is time for open shop testing to cease, he may STOP the appropriate reader device by specifying "TESTS" rather than the unit number, as in the following example:

P TESTS

As earlier mentioned, batch input may also be read from magnetic tape. To achieve this, the following command might be used:

S RDR,290,123456

In this example, 290 is the address of the tape drive and 123456 is the volume serial number of the magnetic tape on which the input exists.

HINT OF THE WEEK

Safe to work alone?

AT sites which are very small or "tight of pocket", the operators are sometimes expected to work alone.

This may be all right when other staff are on the premises, but that is often not the case, as on the evening and night shifts.

At some sites, the security guards enter the computer room to see that all is well, but quite often they are unable to do so as they do not have the appropriate key or other means of entry.

These points are raised by Deborah Palmer, an operator associated for the safety of operations staff, who works at the Worthing, Sussex, installation of the Gateway Building Society.

Says Deborah, "I know of one operator who was knocked out whilst working alone in the computer room. He wasn't found for over an hour and this happened during the daytime, too."

For operators who work by themselves and are worried about their personal safety, Deborah has the following hint.

"Discuss the matter with your operations manager. If he is unsympathetic, and you are not a member of a union, visit your local Health and Safety Executive and ask for advice.

"One operator took this action and was told that they would suggest at least two operators on shift, when there is no one else in the building. The officer also said that he would raise the matter on his next visit to the installation."

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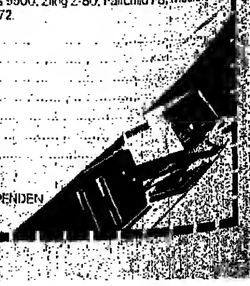

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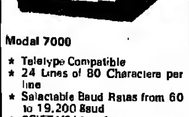

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PEOPLE AND EVENTS

Edited by Nancy Pocock

First director for Avon universities

THE University of Bristol has recruited an expatriate Englishman, at present living in Australia, to head the Avon Universities Computer Centre (AUCC).

Dr G. N. Lance, until recently chief of computing research at the national Australian science foundation CSIRO, in Canberra, will be the first director of AUCC and will be responsible for setting up the centre's computing services, based on a Honeywell Level 68/DPS Multics system (CW, June 22, 1978).

The Multics system, the first to be sold outside the US, was delivered to Bristol shortly before Christmas (CW, December 21/28, 1978) and is expected to complete its CCA trials by the end of March.

Dr Lance, who will take up the appointment in March, has previously been responsible on four occasions for establishing computing facilities. While with CSIRO, he designed and developed CSIRONET, an Australia-wide network based on a CDC Cyber 76 supporting 50 RJE stations and over 400 interactive terminals.

Although primarily intended to serve the five institutions in the area — Bath, Bristol, and Exeter universities, University College Cardiff, and the University of Wales Institute of Science and Technology — the Level 68 is likely in the long term to be integrated into the South-West Regional network as a whole via a link to the 2980 at Bath.

The Computer Board plans that the existing System 4 equipment at Bristol and Bath will then be phased out.

Head of new department at CDC

TO help expand the range of products available from its Data Services bureau division, Control Data has set up a product department to look for new software packages and produce marketing aids for them. The man in charge of the new department is Geoffrey Hollnnd who has been n sales mnnager with the Data Services division till now.

Data Services offers large-scale engineering and scientific processing on its Cyber service, which is based on a line-up of Control Data mainframes in Brussels. It also provides financial modelling on its Call service which runs on 11 IBM 370/158s at Cleveland, Ohio, and general commercial services on its DPS operation based on IBM machines at East Barnet, Herts.

Holland

Mawer

Eric Mower and Bob Steadman have joined Redifon Computers as systems analysts for southern branch. Mawer was previously chief operations support assistant with Boulton and Paul, and Steadman worked for SKF as data control supervisor.

Peter Baxter is to head a newly formed sub-division of the Data Products division of Cole Electronics, which will market a range of systems manufactured by Tab Products of California. He was formerly sales manager of the Data Products division. Kathy Carey, who was previously a punch operator with South Eastern Gas, and Margo Ross, a former programmer at Phillip Morris, will be promoting the products.

Dave Brand has become district sales manager for AMD (UK), with responsibility for the major OEM accounts in the South West. He was formerly field sales manager, integrated circuits, with Mullard Signetics.

Wallace — Frost

Malcolm Sismay has been appointed director of CHA Systems. He was previously general manager with the company. Formerly project manager, Martin Nutkins has been promoted to the position of director of Coulson Heron Associates, while Dave Frost, until recently contracts manager, becomes director and general manager of CHA Installations, with special responsibility for purchasing and contracts. Previously systems analysts, Kerry Davies and David Overson become project managers with the CHA Group.

Bob Wallace has been appointed senior associate consultant with BIS Applied Systems. He was formerly an independent consultant for the printing industry.

Roland Ford has joined Compeda as technical manager, after leaving Atkins Research and Development where he was head of the software department. Alan Clarke becomes a systems engineer at Compeda. He was formerly a member of the applications programming group at the Computer Aided Design centre at Cambridge.

Ian Lambden, formerly a test engineer with the CSS division of the Digital Equipment Corporation, has been appointed o sales engineer for Ampex computer products in the UK and Ireland region.

Geoffrey Griffiths has been appoined sales manager of Arbat (UK). Prior to joining Arbat, he was with Redifon where he was southern branch manager. In his new position he will be responsible for the company's banking systems and the intelex system.

Irene King has been appointed to the board of directors of Jackson Associates. She will continue in her present position of bureou general manager.

Nicol — Stewart

Peter Nicol has joined Grundy and Partners as sales mnnager for Truedata, which is the company's interactive display terminal. He was formerly nrea sales engineer for Electronic Associates.

AMD director

THE new director of European marketing for Advanced Micro Devices is Norm Miller. Ha will be stationed at the company's European headquarters in Brussels, Belgium. Miller was previously director of special projects for the company, and before that was European general manager for Signetics Corporation. In his new position he will be responsible for all European marketing, sales and application efforte.

Ergonomics specialist at Butler Cox

A UK EXPERT in systems ergonomics and word processing, Tom Stewart, has been appointed to a specialist consultant with Butler Cox and Partners. Stewart, who is also a well known author and public speaker, was previously a lecturer at the University of Loughborough. In his new position he will be working on consultancy assignments in the fields of ergonomics, man-machine interface and the effects of systems on people.

Gerhard Andlinger has been elected an executive vice-president of ITT. In March he will also succeed Maurice Valente in Brussels as president of ITT Europe Inc. Valente is to return to New York as a member of the office of chief executive, where he will be responsible for consumer products and services. Andlinger rejoins ITT from Andlinger and Company, a private banking firm, where he has been president since 1076.

COURSES

INFORMATION systems, organisational choice and social values are the subject of an EEC-CNR Crest Course to be held at Pisa University, Italy on April 9-26, 1979. For further information, the detailed course program and applications, please write to Professor G. Treverse, Istituto di Matematica Finanziaria, Via della Faglola 7, Pisa, Italy, before January 31.

DETAILS of the courses and training sessions to be presented in 1978 by Infotech International are now available in a brochure. The courses cover basic skills, programming and advanced systems, management development, mini computers and microcomputers, and data communications. For further information write to Infotech International, Nicholson House, Maidenhead, Berks SL6 1LD. Telephona Maidenhead 35031.

A COURSE on real time computing is to be held at the Hounslow Borough College, Department of Business Studies. The course consists of six meetings on Tuesday evenings commencing January 23. Details from the Head of Department of Business Studies, Hounslow Borough College, London Road, Isleworth, TW7 4HS.

THE London branch of the BCS is running a two-day course on programming standards in South Kensington on February 20-21. It is intended to give programmers and team leaders training and practice in producing good quality, high reliable programs in high level languages. Registration through BCS Hire Office, 01-637 0471.

DISTRIBUTED intelligence and terminal networks is the theme of a five day residential course to be held at the Queen's Hotel, Eastbourne, from January 29-February 2, and organized by Bill Reading details from Jackie Collins Course Register, BIS Applied Systems Limited, York House, 189 Westminster Bridge Road, London SE1 7UT.

CONTROL Data Institute is holding a series of seminars and courses during the first half of 1979. The training programme offers courses applicable to management and to all data processing functions. The seminar calendar is now available and copies may be had from Teresa Barnard Control Data Institute, 77 Wells Street London W1P 3RE.

CONFERENCES

THE analysis of meaning is the theme of Informatics 6, the fifth in a series of conferences on the general theme of representing, organising and manipulating information. The conference will be held at Queen's College, Oxford on March 21-23, and is sponsored by Aslib and the British Computer Society. Papers are invited within the areas of semantics and general semantics, linguistic semantics and applied semantics, artificial intelligence systems and information retrieval systems, and should be submitted as soon as possible. For further information contact The Conference Organizer, Aslib, 3 Belgrave Square, London SW1X 8PL.

RF/INF advances in HF communication systems and techniques is the subject of a conference organised by the IEE, to be held in London on February 27-28 Further information can be obtained from the IEE Conference Dept. Savoy Place, London WC2R 0BL.

THE third international conference on trends in online computer control systems is to be held on March 27-29 at the University of Sheffield. It is organized by the IEE, and further information may be obtained from Annemarie Cunningham Sweendell, IEE, Savoy Place, London WC2R 0BL.

Liveware Saga — by Don

DIARY

JANUARY 16

Student papers on computing. BCS Teeside and district branch, Teeside Polytechnic, Middlesbrough, 18.00.

JANUARY 15-19

Winter projects meeting. SEAS, Brighton. Details from local organisar, el-432 9342.

JANUARY 19

Design and optimisation of job scheduling strategies. I. Mitrani. BCS Formal Aspects of Computing Science Group Polytechnic of Central London, London W1. 18.30.

Working parties' reports, Association of Project Managers. Waldorf Hotel, London WC2. 10.00. Details APM, 01-798 3182.

Microprocessors and portability, Microprocessor Application Group, IEE, Savoy Place, London WC2. 13.30.

An update on planning systems from ICL's point of view. Peter Cook, BCS Urban Planning group, Lamsac, 3 Buckingham Gate, London SW1. 14.00. Please notify 01-629 2333, ext 24.

Problems of changing computers. Robin Screen, BCS Cheltenham and Glos branch. Gele Club, Fourmile Gerdane, Gloucester. 18.30.

Visit to Uotvac. BCS Birmingham branch. Birmingham. 18.30. Details from R. Walthew. Bromsgrove 77077, ext 22.

Visit to the British Shop Research Association for demonstration of computer graphics software. BCS Newcastle branch. Newcastle. 18.90. Notify L. Smith, Newcastle 27520, ext 102.

JANUARY 17

Planning for automation. Tony Benn, Barrie Sherman, Dr David Eversley. Polytechnic of the South Bank, London SW8. 9.15.

User terminals for communication systems, colloquium, IEE, Savoy Place, London WC2. 10.30. Register 01-240 1871, ext 282.

Fault simulation in long-distance transmission systems, discussion. IEE, Dr A. T. Juhne, K. J. Cornick, IEE, Savoy Place, London WC2. 17.00.

Business software for micros. Dick Weller, BCS Sussex branch, Imperial Hotel, Hove. 19.30.

Privacy and computers, census confidentiality, BCS S Wales branch. Business Stats Office, Cardiff Road, Newport. 18.00.

Visit to OITB Video centre. BCS Manchester branch. Knutsford. 18.30. Numbers restricted.

Privacy and computers. BCS S Wales branch. BSO, Cardiff Road, Newport. 19.00.

JANUARY 17-18

IBM CUA Series/1 group. Shakespeare Hotel, Stratford-on-Avon. 14.00.

JANUARY 18

A Univac view of the future for DP. Bill Read, BCS London branch. Waldorf Hotel, London WC2. 18.00.

The long arm of the robot. John McNulty, BCS West Herts branch. Heath Park Hotel, Hemel Hempstead, 18.30.

Computer graphics. Harvey Quillism, BCS Guildford branch. Computer unit, University of Surrey, Guildford. 19.30.

Talking to the computer. W. Henshaw. BCS Bristol branch Institute of Management Services. Bristol Polytechnic. 18.15.

Visit to Mining Research Centre. BCS Nottingham branch. Burton-on-Trent. Details Terry Draper. 0602-40141 ext 4725.

JANUARY 18-19

Series I communications, seminar. Common (Europe) IBM users' association, Westminster Hospital, London SW1. Enrol with Dr T. O. Preston, 01-828 0811, ext 2528.

IBM CUA Local Authorities group, Ashton Court Mension, Bristol, 14.00.

JANUARY 19

Distributed computing research, the state of the art, colloquium. IEE/Science Research Council, Savoy Place, London WC2. 10.30. Register 01-240 1871, ext 282.

JANUARY 23

Naval end underwater medical electronics, colloquium. IEE/IERE. Royal Institution, Albermarle Street, London W1. 14.00. Register 01-240 1871 ext 282.

JANUARY 24

Control of large-scale systems, colloquium. IEE. Savoy Place, London WC2. 14.00.

JANUARY 25

Electronic news gathering. IEE. Savoy Place, London WC2. 14.00. By ticket only from the Secretary, 01-240 1871, ref. LS(E).

Microprocessors, research and its relation to manufacture. IEE. Imperial College, London SW7. 18.00.

Microprocessors in instrumentation. Dr O. S. Everett, IERE/IEE. University Engineering Labs, Trumpington Street, Cambridge. 19.00.

Presidential address. Prof Frank Sumner. BCS Coventry branch. Lanchester Polytechnic, Coventry. 19.30.

Where a date dictionary fits into data management. E. W. Hessell. BCS Leeds branch. Parkway Hotel, Leeds. 6.30.

JANUARY 23-26

Meeting. IBM CUA Programming group, Mostyn Hotel, Leadon. 14.00.

FEBRUARY 1

Presidential address. Prof Frank Sumner. BCS Merseyside branch. Computer Lab. Liverpool University, Liverpool. 18.00.

FEBRUARY 7

AGM/Distributed computing. BCS Data Communications Group. Chemistry Lecture Theatre, Birkbeck College, London WC1. 10.30.

FEBRUARY 13

Systems thinking. Brinn O'Heron. BCS, Reading branch. ICL, Lovelace Road, Bracknell. 20.00.

Computers in X-ray scanning, a breakthrough in diagnostic medicine. B. J. Walmsley. BCS Croydon branch, Fairfield Halls, Croydon. 18.15.

Computer-aided design of printed circuit boards. K. Bennett. BCS Harlow sub-branch. Harlow Technical College, Harlow. 18.30.

FEBRUARY 14

AGM, VME/K subgroup. 29ee User Group. Details: Dr Spratt, (e227) 66822, ext 627.

FEBRUARY 15

Public policy for microelectronics. Nigel Kingsley. BCS London branch. Waldorf Hotel, London WC2. 18.00.

Microcomputers, the electronic accountant? Richard Waller. BCS Coventry branch/ICA. Venue to be announced. 19.30.

FEBRUARY 19

Numerical methods in earthquake and dynamic design. Computer Applications and Methods Group. Institution of Civil Engineers, London SW1. 18.00.

Online print press likely by mid-1980s

A HIGH-SPEED offset printing press that could operate online to a computer may be the successor to the IBM 3800 laser printer in the mid-1980s, according to a report on printers and printer technology, now available from the US organisation, SBS Publishing. The report concerns itself with the use of printers in the much discussed "office of the future" and covers a wide range of application areas, including word processing, electronic mail, computer output microfilm and intelligent copying and facsimile printing.

Two rapidly developing non-mechanical printing technologies — ink jet printing and xerography / electron photography — are each discussed in chapters of fewer than ten pages, while 24 pages are devoted to mechanical printing.

The report predicts that Xerox will become a major competitor for IBM in the next two years as a supplier of ink jet printers for word and data processing systems. It also predicts that Centronics and Dataproducts will soon announce low cost matrix ink jet printers, and that IBM will announce ink jet based units in 1981 to replace the daisy wheel printer mechanisms that it buys in from Qume and later to replace its Selectric golf ball printers.

Teletype and AT&T are predicted to move into the ink jet printer market in the early 1980s.

A chapter on "exotic" technologies in printers includes techniques that are already used commercially, like thermal matrix printing, electrosensitive printing — where an electrical voltage is applied to specially coated paper — and electrographics, the technique used by Honeywell in its 18,000 lpm Page Printing System.

A less familiar technique discussed is aerosol ink mist, where a mist is applied to plain paper and characters are formed by a free-ion generating matrix. The colour of the ink mist could be changed as required.

Another "exotic" technique, magnetographics, is described in the report as "a sleeping giant". This technique involves a mist of magnetic ink and could be employed in an offset printer where the ink would be applied to one roller, ironsferred to a second and from that to the paper. The report includes a diagram of such a machine — an ink mist printing press — that has been patented by IBM.

*Printers for the Office of the Future. 150 pp. $750. SBS Publishing, 4526 Stevens Creek Blvd, Suite 108, San Jose, California 95129, USA. Tel: 0101-408-243-8121.

Plessey to sell US bank terminals in UK

LATEST contender for a share of the increasingly crowded UK market for banking terminals is Plessey — with a line of branch controllers and terminal units from US terminals manufacturer Bunker Ramo. As exclusively revealed in Computer Weekly (November 23, 1978), Bunker Ramo is in final negotiations with Univac on an agreement under which, where appropriate, Univac will recommend Bunker Ramo terminals to banking customers for its mainframes. However, in the UK, Plessey will be the sole source for the terminals.

The modules on offer from Plessey are the Bunker Ramo System 90 line, which includes a branch controller, a validation/journal printer, a compact teller terminal, and an administrative VDU terminal.

The controller is a very compact minicomputer backed with a floppy disc unit.

The processor is built by Bunker Ramo, but based on Digital Equipment architecture, and can address up to 256 devices and be backed with up to 256K-bytes of memory.

The Teller Terminal includes a 5in CRT display which puts up six lines of 40 characters, 30 function keys, a numeric keypad, and is built around the Motorola 6800 microprocessor. It takes an optional card reader and an alphanumeric keypad for use by customers at the teller window.

Other display terminals on offer are a 8in 960 character VDU and a 12in 1920 character VDU. There is a passbook printer and two heavy duty printers.

The minicomputer is programmed in a proprietary table-driven language, and protocols are available for communication with IBM, Burroughs, Univac and Honeywell mainframes.

ICL managers dispute

MANAGERS at ICL, disputing the company's offer of relocation expenses after being moved from Bracknell to Slough (CW, November 30, 1978), will be meeting with the company next Monday, January 15, with a representative from ACAS, the independent arbitration and conciliation service, in a bid to find a solution to the problem.

Both sides have previously met with ACAS and although the managers are not optimistic of a quick solution, a spokesman said, "A 50% improvement on the present offer would make us more than happy."

Change in jobs market warning

A WARNING that the shortage of computer professionals in the UK could eventually come to an end was given at BCS 79 by David Firnberg, director of the National Computing Centre.

He said that he had recently been informed during a trip to Finland that, although there was a severe shortage of computer professionals in that country three years ago, the situation had now been reversed and there is a shortage of jobs for trained computer people.

Last year, the French computer paper 01 Informatique reported that many computer professionals in France were out of work.

Less noise

NOISE levels from daisy wheel printers can be reduced using the Powquip range of acoustic covers now available from the Power Equipment Company of London. PEC claims that the Powquip covers reduce noise by 75% or more without any hindrance to accessibility or visibility.

So simple to operate

JUST two front panal controls are needed to operate the CS3 Intelligent Cassette Terminal shown here. The CS3 is manufactured by Digital Peripherals of Painswick, near Gloucester, and connects up to a computer like a standard peripheral. Two integral microprocessors control the operations of the CS3, which include reading and writing data at up to 560 chps and automatically correcting a variety of errors. Options include the capability to read and write cassettes to Texas Instruments Silent 700 standard.

More links for IPSS on cards

THE Post Office's International Packet Switching Service, which came into operation at the end of last year, allows users in the UK and the US to access computer services and databases across the Atlantic although many more are on offer in the US than in the UK.

Canada, Japan and Eire may later be linked to the network.

The IPSS exchange in London, based on a Telemet packet switch, is accessed over leased or dial-up lines in the telephone network until PSS, the Post Office's domestic packet switching service, starts up later this year.

This means that access will be much more expensive for users outside London in the interim period. PSS charges will be distance independent.

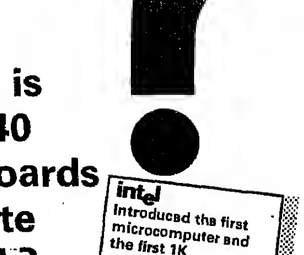
The four parts of the IPSS tariff are connection, £25 for dial-up and £150 for leased line, annual rental £20 for dial-up and from £100 to £800 for leased lines plus £6 an hour and £4 per kilosegment or 64,000 characters at all data rates.

TV sets with built-in decoders

COLOUR television sets with built-in Texas Instruments decoders for both teletext and Prestel viewdata are on the way to the UK from Finland. The Finnish manufacturer Salora has sets incorporating the TI XM-11 teletext decoder ready for shipping to the UK this year, and is testing sets incorporating the TI VDP-11 viewdata decoder for delivery later in the year.

Salora is also monitoring developments with viewdata in West Germany and Holland, both of which have bought rights to the UK Post Office viewdata software and expertise, with a view to offering sets in those markets.

Did you know that Intel sell a fast 16-bit computer with 48K bytes of memory, lots of I/O and other facilities on a single board less than 12 inches by 7 inches ?



Did you know that this is just one of more than 40 compatible computer boards as well as three complete systems offered by Intel ?

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If the answer is 'no' to either of these questions and you use *minicomputers* or *microcomputers*, or manufacture *data communication* equipment or *peripherals*, you should find out more because you are missing something worthwhile. We are holding a seminar on these products at the Cavendish Conference Centre, Duchess Mews, London W1 on January 23rd to describe the application and use of these computers in addition to the financial implications of employing them.

BOOK NOW TO ENSURE A PLACE
(If you answered 'no' to either of the above questions, can you afford not to?)

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Scratching where it itches

REPORTS FROM THE FOUNDATION

Reports from the Foundation is a new Computer Weekly series based on the work of the Butler Cox Foundation research group. The reports will examine a variety of topics relating to the development and use of information technology. In this first report, the Foundation chairman, DAVID BUTLER (pictured left), takes a look at the future role of the management services. Butler is chairman of Butler Cox & Partners, and is responsible for all the company's research-based services.

TWO tramps were sitting on a park bench. "Would you like a steak and chips?" says one. "Yes please," says the other. "Me too," replies the first, staring glumly into space.

Reflect for a moment upon this exchange. The first tramp has made a correct analysis of the second's needs: spot on, no question about it. In fact he fully endorses the need, subscribes to it himself. But he lacks the means to satisfy it. The humour (slight as it is) derives from the fact that by asking the question the first tramp is assumed to be capable of providing the answer. The question is taken as an offer.

A management services director and his boss were sitting on a bench in a park. "How would you like an information system that is designed to reflect rather than dominate your organisation structure, provide good communication and a high level of decision-making support, all at a price you can afford?" says the MSD. "Yes please," says the boss. "Me too," says the MSD staring glumly into space.

In this case, however, the joke is on the management services director. For in truth technology now exists for him to deliver the kind of system he has described. Much of the ill-repute in which systems were held in the past has stemmed from the inability of the systems manager to deliver a product which matched the expectation of the user. There is plenty of evidence that this situation need no longer prevail.

What lies behind this transformation in the ability of systems to meet the user's needs? There are many specific developments which are contributing towards this change. They include the advent of economic word processing equipment, the imminent availability of viewdata, the possibility of improved facilities for telecommunications such as electronic exchanges and satellite channels and a host of other specific developments. I want, however, to explore in this introductory article the basic phenomenon which I believe lies at the heart of all these developments. It has been termed the Convergence of Technologies and it manifests itself through the ubiquitous microprocessor.

'Silicon technology — the technology of the computer industry — has invaded the telecommunications industry and the office products industry. The techniques devised by computer manufacturers and the suppliers of semiconductors have become basic to the production of stored program control (SPC) telephone exchanges such as the microprocessors that appear in communication satellites and word processing systems.

Consider for a moment the importance of this change upon computer companies and telecommunication suppliers. In the past the major telecommunication firms enjoyed a virtual monopoly in the supply of exchange equipment, switching devices and subscriber apparatus to the telephone administrations of the world. Ten years ago it would have been unthinkable that a computer company might attempt to break into this market.

Today, however, we see that IBM has become one of Europe's largest suppliers of private SPC exchanges. Its current offering in this market, the 3750, has achieved a useful penetration of the market in Europe, although it has not been released as a product in the US. There can be little doubt that IBM would also like to break into the market for what Americans call "main office equipment" and what we call "central telephone exchange equipment." A sceptical reader might doubt whether IBM could achieve this aim, since the PTTs of Europe might be expected to resist it. But the same sceptic would have been doubtful about the future of the 3750 — and would have been wrong.

On the other side of the Atlantic IBM, together with two partners, has established Satellite Business Systems Inc to provide services within the US for broad-band communication of voice, data, text and video traffic.

While all this is going on at IBM, other companies are seeking to widen their product range to reflect the reality of convergence. Research and development costs and marketing expenses associated with microprocessor based products can be spread very thinly over a wide range of technological products. For this reason we see the giant American oil company Exxon acquiring a number of companies in the area of office systems. One of their most interesting acquisitions is the Delphi company which offers a very advanced voice switching system capable of expanding into other application areas such as electronic mail.

We see Nixdorf developing its own range of highly specialised telephone handsets. We see companies such as Plessey and GEC adding new features to their traditional telephone exchange equipment to permit the switching of different kinds of traffic. Perhaps most alarmingly we see the largest communications company in the world, AT&T, launching an intelligent network service in the US which can only be interpreted as a frontal assault on IBM. This will lead to the greatest legal battle in the history of computing.

Against such a background, the individual user must try to plot a path which is secure, cautious without being reactionary and reasonably cost-effective. It is impossible to plot such a course if decisions are made piece-meal. Each new product and service offered to the user needs to be evaluated and interpreted against a coherent view of the future of systems. There is no other way to avoid going into a technological cul-de-sac.

There are a number of lessons which the user must learn. The first is to broaden his vision of the role of systems. Our research suggests that the average company spends around 2 per cent of its total cost on conventional DP applications. To top management, such a sum often appears trivial, accounting for the lack of interest which main board directors often show in DP. The cost of handling information in the same company, however, is likely to exceed 20 per cent of total cost.

Many of the most important developments in systems over the next five years will be outside the domain of conventional DP. They will be concerned with the quality of office services given to managers and skilled technical staff in areas such as voice telephony and text processing. They will directly influence major areas of excessive cost and poor performance — what the Americans call "scratching where it itches."

Most management services directors also recognise that the skills available to them are deficient in terms of the scale of the opportunities. In many companies the management services director and his staff have mostly grown up in the field of DP. Telecommunications and office automation are areas where they lack the intuitive skill that goes with experience. In most companies there is an urgent need to increase the range of available skills in these areas.

And so the information system which matches rather than dominates the organisation and provides accurate and timely information to support decision making is a technologically feasible proposition. The scarcest resource in this equation is neither technology nor money, but the human skill and ingenuity required to conceive, conduct and operate such systems.

The competitive advantage of those companies and nations which most successfully rise to this intellectual challenge will be enormous and perhaps decisive.

Eyes and ears

The Butler Cox Foundation is a research group which [illegible] major developments in its field — computers, telecommunications, and office automation — on behalf of subscribing members. It provides a [illegible] "eyes and ears" on the [illegible] for the systems departments of some of Europe's largest [illegible]cerns.

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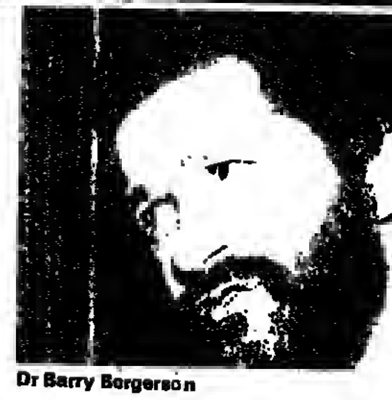


Dr Barry Borgerson

ALL the major computer companies now have their own in-house semiconductor research establishments, but much of the work is carried out unseen and unremarked.

However some extremely interesting pointers to Univac's thinking and plans in the microelectronics field emerged when Dr Barry Borgerson, director of research and technical planning, visited London last month and gave Computer Weekly an exclusive interview.

The principal technologies that Univac is working on for VLSI, very large-scale integrated circuitry, are short channel N-MOS and SOS C-MOS. It is also researching into Gallium Arsenide as an alternative substrate material to Silicon.

"Electron mobility in Gallium Arsenide is five times greater than in Silicon, but it is expensive, and the performance achieved with Silicon keeps improving," said Dr Borgerson. "We are also working on very fast emitter-coupled logic.

"In fact we have in-house facilities for four technologies: ECL, NMOS, CMOS and Gallium Arsenide. We have to have our own: not only is it cheaper than buying in the chips: the circuits that we want are simply not available from third party suppliers. The volumes are too low and would be given low priority by the semiconductor manufacturers."

The company has both electron beam and X-ray equipment for circuit drawing, and Dr Borgerson says that a combination of the two looks promising for producing high density circuits. The approach involves drawing masks using electron beams, and then using X-rays to etch through the masks on to the chip.

Although not following IBM down the Josephson Junction path, Univac is studying the effects of temperature variations on different materials.

Josephson Junction technology enables very high-speed logic to be built, but requires temperatures close to Absolute Zero (−273°C) to operate. However the ability to operate over a wide range of temperatures is also important, and Univac is studying Niobium-based technology.

Industry speculates over rumours of 'entirely new' Intel 16-bit device

SPECULATION is rife that Intel could be introducing an entirely new 16-bit device in addition to enhancements on its 8086 16-bit chip.

The enhancements include an 8 MHz version, which will upgrade the throughput of the standard version with its 5 MHz clock rate. They will also include the 8089 input/output processor and 8088, 8-bit data bus version, which were both first rumoured over a year ago (CW, November 24, 1977).

The 8089 is expected to be introduced during the second quarter of this year, and is an important peripheral device in the 8086 range. Its function will be to take a substantial load off the CPU chip in systems where there is a large amount of I/O processing.

The 8088 will follow a similar approach to that followed by Texas Instruments with its 9980/9985 versions of the 9900.

A further enhancement that is the subject of speculation at present is a single chip version of the 8086. An Intel spokesman in Santa Clara, California, confirmed that such a device was the subject of a current research project within the company, but said that there was no timescale laid down for its introduction.

More speculation centres around a microprocessor that is being called the 88000 in industry. The speculation suggests that this part will be a completely new 16-bit design that will quickly supersede the 8086.

The Intel spokesman said that he had heard this rumour, and suggested that that is all it was.

Motorola market test hots up 64K RAM race

THE race to be the first company to actually have the first 64K-bit RAM to market hotted up considerably last week with the news that Motorola had just produced its first test samples of the device in the US.

Though the Japanese company, Fujitsu, was the first to make samples of a 64K device available last year (CW, April 13, 1978) this part was dismissed by many experts because of its non-standard power supply requirements. The big race was felt to lie in being in the market with a single 5-volt supplied component, with an access time preferably in the 150 nanoseconds range.

Texas Instruments were the first to announce such a part, but this is now the subject of some delay, and the company is telling major customers not to expect samples until February at the earliest.

Now Motorola is poised to make its bid. The part fits the basic criteria generally assumed by experts to be the right one, having a 150 nanosecond access time, and a power dissipation of 250 milliwatts. The power supply is a single +5 volts.

The only other manufacturer with a 64K memory available is IBM. This part has been in full production for about a year, according to the company, though it is very unlikely that any of them will come available on the open market.

Among the other contenders expected to have samples of their 64K memory available during the next few months are Mostek, Intel, National Semiconductor and a variety of Japanese manufacturers.

There is growing speculation, in fact, that some form of agreement will be reached by Mostek and Intel on standardising their respective devices, as a follow-on the second sourcing agreement on the Intel 8086, 16-bit microprocessor.

The form of the agreement is till very much open to question, for though the two memory specifications are broadly similar, they have one fundamental difference. As these devices use a single power supply voltage, one of the 16 pins in the package is left unassigned. Intel favours leaving it as such, while Mostek favours putting on some useful function, such as automatic refresh, on to the pin.

Motorola has also been active in development associated with the MACS 68000 16-bit microprocessor. Some of this work has gone into providing extra software support. While the chip's own compiler will be written in Pascal (CW, September 7, 1978), the company is now also developing Assembler and Simulator cross-products written in Fortran.

According to the company this is only a temporary step. The cross-products are intended for major potential users that already have mainframe computer installations available for systems development work.

Also in the pipeline is a new development system for the micro, which has already been unofficially christened "MACSorcisor", after the existing EXORcisor system.

Two features currently understood to be planned for the new development system are downward compatibility to the existing 6800 family of microprocessors, which would allow one system to be used for all device types from Motorola, and a multiple-seat capability.

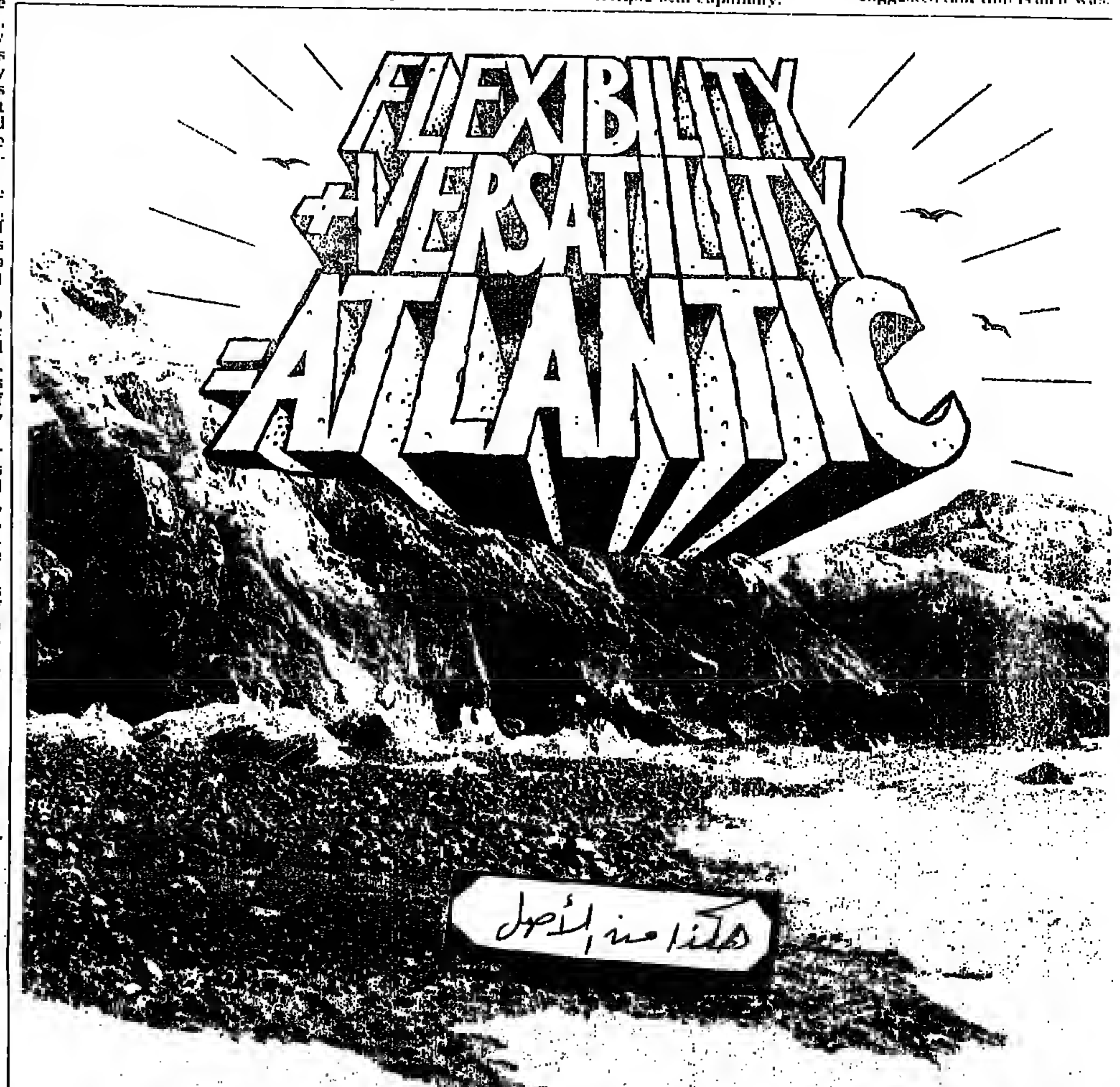
Scrumpi maker dies

JOHN Miller Kirkpatrick, founder of Bywood Electronics, and one of the best known characters of the personal computing scene in the UK, has died. A computer programmer and systems analyst by training, he started Bywood at the beginning of the digital clock boom, selling kit systems. From this he moved into the low-cost microcomputer field, with a £60 kit based on the National Semiconductor SC/MP processor. This was Scrumpi 1, which was followed in rapid succession by enhanced versions that kept the Scrumpi name. About three months ago John fell ill. At the time, Scrumpi 4 was on the stocks.

Query over TI personal system

AMERICAN reports suggest that Texas Instrument's projected launch date for its personal computer systems may be slipping away from the target of this month.

The company had asked the US Federal Communications Commission to test the systems RF modulator for RF energy emissions separately from the rest of the hardware, even though such emissions are generated by other parts of the system. It is not known why the system failed the test, or even if the FCC carried it out, but it seems FCC approval has not been forthcoming.



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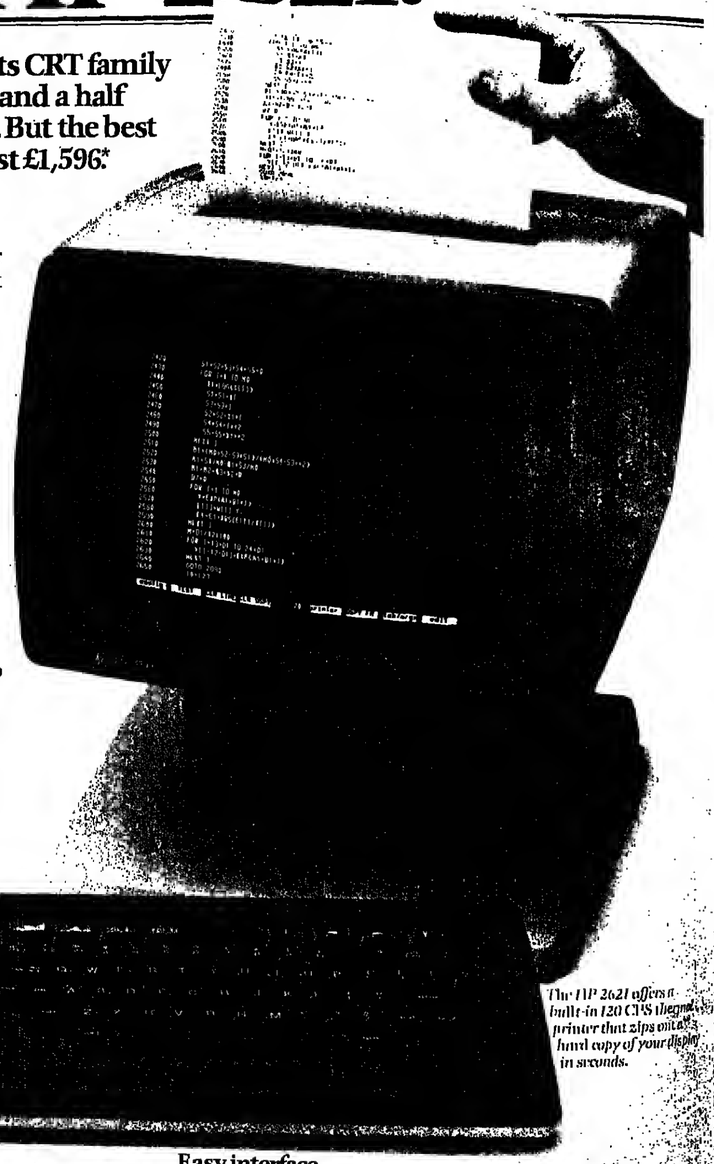

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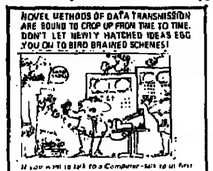

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Canadian privacy threat

THE Consumers' Association of Canada has expressed concern to the Canadian Parliament that a proposed nationwide bank payments system would constitute a threat to individual privacy. The Association wants four members of the general public on the board of directors of the Canadian Payments Association, the system's operating body.

Commenting on the large amounts of information on individuals that would be accessible on computer files, Helen Anderson, of the CAC, said: "It's 1984 staring us in the face. It's Big Brother. I think we will lose the battle by default unless we all stand very firm on this."

Mexican offshoot

A MEXICAN subsidiary has been established by plug compatible peripheral manufacturer, Storage Technology. Based at Mexico City its first customer is the Institute of Technology at Monterrey.

8100 for S Africa

IBM has sold the first 8100 information system in South Africa to Pretoria College for Advanced Technical Education. The system will consist of a central processor and online display screen and printers which serve as workstations. Although the system can stand alone it will be linked to the Department of National Education IBM 370 installation, also in Pretoria.

More Amdahls

FOLLOWING installation of the first Amdahl 470V/6 at the Italian Finance Ministry (CW, April 27, 1978), three more of the IBM plug-compatible mainframes have been installed with agencies of the Italian government. The Finance Ministry has installed a second V/6, and the Italian Treasury has installed two, replacing several large-scale IBM 370s in the process.

Tandberg rescue

A RESCUE plan has been formulated for the computer peripheral interests of the bankrupt Norwegian company, Tandberg (CW, January 4). A new company, owned 40% by Norway's national Industrial Aid Fund, and 20% by the Kongsberg heavy engineering and electronics company, minimaker Norsk Data, and the Simrad electronics company, is to negotiate with the Tandberg receiver for acquisition of the visible parts of the company.

Plans for Mark III

THE new company, General Electric Information Services, formed to operate and market the GE Mark III time-sharing service worldwide, has now come into formal existence (CW, June 15, 1978). GE plans to offer users intelligent terminals for attachment to the network along with applications software which is on test in the US.

Framework for sharing technology with Third World

BILATERAL collaboration between one developed and one developing country provides the most viable framework for the sharing of computer technology, believes Alan Benjamin, director-general of the UK Computing Services Association.

Speaking to the Specialist Group for Developing Countries at BCS 79 in London last week, Benjamin noted that CSA members were working in 68 countries, many in the Third World, and said that UK government-backed collaborations were being discussed with the governments of four countries.

The four are Mexico, Greece, Turkey and the Sudan. The ventures are in various preliminary stages of discussion.

He rejected the term "technology transfer", preferring to talk of sharing technology — "sharing implies that there are no strings attached," he said — and outlined three preconditions for successful sharing of technology:

- The needs of the developing country should be clearly identified and stated;
- The developing country must be prepared to devote adequate resources to the projects;
- The projects should be independent of political constraints, since changes of government are particularly unpredictable in developing countries, and unless projects were seen to be of value by government and opposition alike they were likely to founder following a change of regime.

Amplifying this point, he cited Iran, where many of the more ambitious computer projects are threatened by the current unrest. In particular, he stressed the need to outline clearly the consequences if a particular project were not carried out.

Although the concept of sharing implies a matching of resources with needs, the resources being with the developed country and the needs in the developing, the flow of benefits was by no means one way.

"We are involved with one country where an intensive three-day session made it clear to us that they had thought through their training requirements far more thoroughly than we have, and some of their procedures could be applied to advantage in the UK," he said.

"Since typically one is involved in detailed day-to-day discussions with the government of the developing country, one gets surprisingly close to the fundamental workings of that government, and is in a unique position both to influence and to learn."

Outlining the kind of projects the UK government and the CSA are keen on initiating in partnership with Third World countries, Benjamin took the example of one country where collaboration is getting under way.

"They had one vital government computer system hanging by a thread, with a single ageing analyst the only person who really understood it. We are now laying plans to put together a training scheme for ministry personnel, looking to develop mid-term administrative systems, and establish standards and documentation systems.

"It should lead to the development of two or three major systems. The only condition that we are imposing is that at every stage of every project, indigenous staff of the country should be present and involved."

Power back-up for Delhi 2960

THE ICL 2960 for the New Delhi Indian Institute of Technology is to be powered by a Chloride Transipack uninterruptible power supply worth £54,000. Now installed in Delhi, the power supply, shown in the picture undergoing final tests at the Hastings factory before despatch, will protect the computer from Delhi's erratic electricity supply, and includes batteries capable of maintaining power for up to 15 minutes in event of blackout.

● The 2960 has given ICL something of a breakthrough in India. Following this order from the National Dairy Development Board in Delhi, which also wants a 2903 (CW, June 1, 1978) BHEL, Bharat Heavy Electricals is getting two 2960s and one 2904, while a 2960 is also on order for Kirloskar Oil Engines. Pune and Varanasi Universities are each to get a 1904S.

South African handbook

"OUR 66th year . . . and still going strong," reads the front cover advertisement by ICL on the first issue of the South African Computer Users' Handbook.

"For many years there has been a growing need for a handbook of facts on computers and data processing in South Africa," says a statement by the publishers.

The five key headings included are recruitment and personnel, computer suppliers, general/business equipment, consultants/software/services, computer installations, and associations and utilities.

Of interest to many will be the computer installations section which gives a comprehensive list of definite mainframe/minicomputer/micro systems installed.

Further details from Systems Publishers (Pty) Ltd, P.O. Box 31720, Braamfontein, 2017, South Africa.

Transpac goes live —but with only four switching centres

THE French national public packet-switched service Transpac came into service just before Christmas — but in a highly truncated form. Only four of the 12 switching centres planned to be operational from day one actually came into service. Two are in Paris and the others in Rennes and Lyon.

Since October, when the part privately-owned Transpac company opened its doors to subscribers, over 100 organisations have reserved ports on the network, which uses the international X25 packet-switching interface standard.

Transpac offers virtual circuit full duplex synchronous communication at 2,400, 4,800, 9,600, 19,200 and 48,000 bps. Both permanent and switched virtual circuits are offered (the packet network equivalents of leased and dial-up lines), plus two modes of connection, packet mode for users capable of formatting their own packets for the network, and character mode for asynchronous terminals.

There are three elements to the Transpac tariff: a monthly connection charge, a circuit charge and a traffic charge.

Taking 2,400 bps traffic, the connect charge is 800 francs per device per month, the charge for a permanent virtual circuit is 216 francs per month for each location to location link, or for switched virtual circuits, 0.01 francs per minute per circuit and a traffic charge of 0.06 francs per Kilobyte of data transmitted.

The traffic charges are reduced by 40 per cent after 7 pm, before 8 am and on Saturdays, and by 80 per cent from midnight to 6 am every day and all day Sundays.

For people without a local packet-switching exchange, the direct access charge is replaced by the standard telephone or telex charges to the nearest exchange. It is noteworthy that charges on the network itself are volume-dependent but distance independent.

The Transpac operation company is 67 per cent publicly owned. Another 28 per cent of the shares are owned by a company called Utipac, in which 14 founder members, all of which plan to be big users of Transpac — banks, Air France and so forth — hold shares, and which any user can become a shareholder. The remaining 5 per cent of the shares are held by PTT employees.

Iberia joins the Univac flight path

THE Spanish national airline Iberia has followed Lufthansa and SAS along the prescribed Univac migration path by laying plans to replace its Univac 494 mainframes with an 1100/80 system.

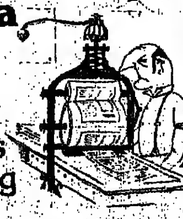
As an interim step to installing the four-processor 1100/84 system, the airline is to supplement its existing three 494s running reservations, and two 1110s running sales and revenue accounting, with an additional one of each.

Iberia will be moving over to the comprehensive USAS Univac Standard Airline System. The switchover will be carried out over three years, starting this year.

The business is worth $17 million to Univac.

● In Japan, All Nippon Airways is running its reservations on a Univac 1100/43 system supporting Mitsubishi reservation terminals, and plans to add online ticketing this year.

Publishers
Ginn & Company
who know how to read between the lines booked an
Interdata
transaction processing system for their sales order tracking from



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The new big name in computers

Federal agencies budget for big expansion in spending on DP

EXECUTIVE branch agencies in the US Federal government are expected to increase their spending for general-purpose data processing activities from $3,707 million in Fiscal Year 1977 to $4,660 million in FY79. Executive agency spending for DP activities during FY 78 was expected to total $4,237 million.

These and other statistics on Federal DP resources were compiled by the US Office of Management and Budget, based on data included in the 1979 budget of the US Government that was submitted to the Congress last January.

In the summary information, now released, the Management and Budget Office points out that the figures do not include resources for items such as "classified" DP activities; computers which are an integral part of combat weapons, space and similar systems; telecommunications associated with the transfer of data, as contrasted with the processing of data; and analogue computers.

OMB points out in its report that annual obligations for general purpose DP activities of executive agencies, which represent slightly less than one percent of the total budget, continue to grow at about the same rate as the total Federal budget.

The OMB report points out that the number of computers owned and leased by Federal agencies for general purpose DP increased significantly during FY 77, from 3,903 to 5,000, and further growth is anticipated during FY 79.

The trend toward purchasing rather than leasing computers in the Federal government is continuing. At the end of FY 77 the government owned 79.3% of its general management computers and 97.6% of its special management computers.

Other trends in spending patterns show that the actual obligations for purchase and rental of computers continue to be less than the executive budget for these purposes.

The Federal DP workforce has remained relatively stable in the past decade. OMB says the increased workload has been met largely through increases in the purchase of commercial services for systems analysis, programming and computer operations rather than through increases in permanent personnel.

While the proportionate amount of DP resources spent for commercial services had been increasing rapidly (from 23.7% of the total in FY 76 to 26.4% in FY 77), the amount spent for purchase of commercial computer time sharing services has not increased at the same rate as other types of services, Figure 1.

The most significant increase has been in the purchase of systems analysis and programming services (from 7.8% in FY 76 to 8.1% in FY 77) and in the purchase of operational support services (from 4.1% in FY 76 to 4.9% in FY 77).

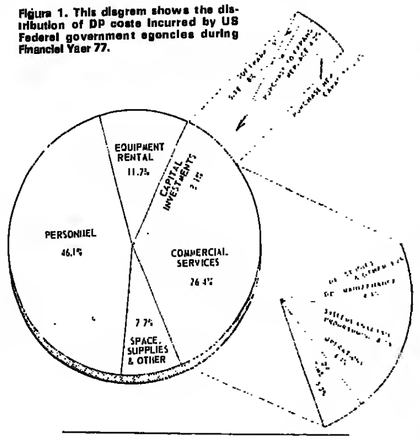
The operational support services category includes contracts for the operation of government computer facilities as well as some contractor facilities which are dedicated to supporting specific federal agency work.

The most significant difference between Federal and private sector computer spending patterns in the US, OMB says, is that federal agencies spend proportionately more for commercial DP services and less for hardware than private sector firms, Figure 2.

For FY 77, the Federal government spent 28% of its total budget for outside services and 22% for hardware. The comparable figures for the private sector during the same year were 16% and 35% respectively.

For FY 78, the Federal government was expected to spend 28% for outside services and 23% for hardware, while private industry was expected to spend 17% for outside services and 35% for hardware.

Figure 1. This diagram shows the distribution of DP costs incurred by US Federal government agencies during Financial Year 77.



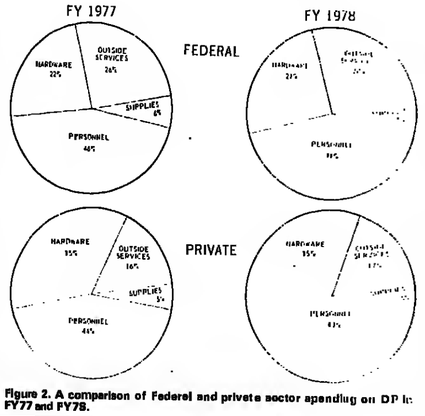


Figure 2. A comparison of Federal and private sector spending on DP in FY77 and FY78.

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WASHINGTON REPORT BY CAMERON DAVIS

Imports and exports increase

US imports of computer and business equipment products rose 43% to $568 million during the third quarter of 1978. Imports from the US hit the $1.3 billion mark, a rise of 29.1% over the same quarter a year ago.

These figures, compiled by the US Department of Commerce, indicate a favourable balance of trade for the US computer and business equipment industry of $7-10 million, or a 20.2% increase over the 1977 third quarter.

Overall, the first nine months of 1978 showed a positive balanced trade of $1,890 million for the industry. That represents an increase of 16% over the $1,710 million reported for the first nine months of 1977.

According to Commerce Department data, US exports rose 26% during the nine-month reporting period from $2,132 million in 1977 to $3,620 million in 1978. Imports, however, experienced a substantial increase of 40%, going from $1,160 million in 1977 to $1,630 million by the end of the first three quarters of 1978.

Computers and related equipment, including parts, accounted for over 80% of the industry's export total in the first nine months. Broken down further, computers and related equipment exports for the period were at the $1,088 million level, while during the same period in 1977 the figure was $1,700 million.

The level of exports for parts for computers and peripherals for the nine month period for 1977 was $658 million, but for the same three quarters in 1978 the level of exports had risen to $1,100 million.

Imports of computers and related equipment rose 41% to $184.2 million during the first nine months of 1977 (a $261 million for the same period in 1978).

The figures on calculators reports revealed a decrease of 4% from the first nine months of 1977. Imports of calculators into the US, on the other hand, rose 49% from $167.27 million in the first nine months of 1977 to $250.5 million in the same period of 1978.

A very significant increase was recorded in the product area of copying machines. Imports rose 75% from $126 million for the three quarters of 1977 to $221 million in the same period in 1978.

Overall, the US trade totals at the close of the third quarter reflect the fact that distribution of computer and related equipment to the major sectors, 18% typewriters, copying machines, 13% machine parts, 11% other categories, 10%

AT&T rival gets the go-ahead

AN appeal by AT&T over the supply of local telephone interconnections to MCI Communications Corp of Washington, so that it can expand its Execunet long distance telephone service, is not to go to the US Supreme Court. The court has declined to review an earlier appeals court ruling that said the needed interconnections must be provided. AT&T and the Federal Communications Commission had challenged the appeal court ruling in their quest for a Supreme Court review.

The Supreme Court's action marks the end of a three and one-half year legal battle over MCI's right to offer Execunet, a service that connects MCI intercity lines with local exchange facilities of the Bell System. AT&T had argued that Execunet was not a private line service, which the specialised common carriers are clearly authorised to offer, but rather was a long distance message toll service and wide-area telecommunications service. Such services were thought to be the sacred territory of AT&T.

A district court ruled in July, 1977, that Execunet did indeed resemble MTS and WATS services but added there was nothing on the FCC books that prohibited competition and the belief that those services were exempt from competition was merely an ego-old assumption perpetrated by AT&T.

AT&T and the FCC have repeatedly appealed the ruling and have continually been rebuffed by the courts. The Supreme Court action gives MCI carte blanche to expand Execunet, pending completion of the public interest inquiry by the FCC.

More funds pledged for R&D

THE Carter Administration is committed to increased support of research and development in the US, both through Federal funding of R&D and through Federal incentives for heightened R&D activity in the private sector.

That promise came from Richard Atkinson, Director of the US National Science Foundation, in his keynote address at the annual meeting of the Association for Computing Machinery held last month in Washington.

During the past decade the US has "slipped dramatically" in its support of basic research, said Atkinson, and at the same time other countries had boosted their R&D efforts.

Citing NSF statistics, Atkinson pointed out that the US spent 3.1% of its gross national product on R&D during 1966. A decade later, R&D as a percentage of GNP has slipped to 2.2%. Over the same period of time, the Soviet Union increased its R&D expenditures from 2.4 to 3.2% of GNP; West Germany 1.6 to 2.1%; and Japan from 1.4 to 2.1%.

These figures, coupled with the fact that federal funding of R&D plummeted from 13% of the Federal budget in 1966 to six per cent in 1976, point to "a sorry state of affairs" in the US, Atkinson said.

"Also, the more research and development you do outside the country, the less your tax bill will be," he added. "Now I think there's something wrong with that." It may be time to draft some Federal tax incentives for R&D activity, Atkinson said.

One plan to counteract the decline in R&D in the US was to pour more Federal funds into universities, with those funds earmarked for research in computer sciences. An increase in Federal grants for basic research in industrial innovation could also be expected, said Atkinson.

In 1977, only 300 persons graduated from US universities with PhDs in computer sciences. Another 2,800 persons obtained Master's degrees in that field. "This level in no way meets the needs of the country," Atkinson asserted.

He noted that the US had set aside some $36 million for computer science R&D this year and, so far, President Carter had managed to keep that budgeted sum intact despite his efforts in trimming the Federal budget to combat inflation.

How much more money the US can funnel into R&D activities this year over and above the allotted funds depends on some Federal studies now underway.

Atkinson noted that a Computer Sciences and Engineering Research Study is expected to be published this month, while completion date for the President's special commission studying industrial innovation was set for April. The latter study will offer "policy options" to Congress that could provide a shot in the arm for increased Federal R&D efforts.

S African 'threat to individual privacy'

From Esmond Frank in Johannesburg

RAPID advances in computer technology pose a serious threat to the privacy of the South African individual, warns André Botha, offical spokesman for the Computer Society of South Africa. "The potential for the abuse of computer technology is clearly here," he says.

And he admits that the local computer industry has been "rather lax" in formulating a code of ethics, although it is seriously considering the appointment of an "Ombudsman" to hear complaints on computer data abuse from members of the public.

He does not believe, however, that legislation to control the use of computerised personal data will be introduced in South Africa until there is a public outcry about abuse.

Botha points out that while the potential for abuse definitely exists in the country, computer decentralisation in South Africa makes abuse more difficult than in Socialist countries where all data is fed into a central computer "monster".

Although it is technologically possible, he says, there is as yet no national computerised data file in South Africa, and individuals have little to worry about until a national computer bank is established.

Questioned about government use of computerised information in South Africa, Botha says he was personally involved with the installation of the system used by the Department of Interior.

"The government, I am pleased to say, took a strong line after recognising the potential for abuse and has incorporated built-in safeguards to ensure that personal information stored in the system cannot be retrieved for the wrong sort of usage."

Of more immediate concern, according to Dr Paul Sulcas, a senior lecturer in accounting at the University of Cape Town, is the abuse of computers to defraud big business.

"I believe," he says, "that the computerised defrauding of business is definitely taking place in South Africa, but the full extent is not known.

"Because of the lack of publicity, the problem isn't coming to light. As a result, the perpetrators are not being apprehended and prosecuted."

Geoff Gniwitz, a specialist in computer control, says that while technology for controls and security exists, it is not being applied.

He adds that while most computer frauds are perpetrated for financial gain, computer abuse is also involved in many industrial espionage operations.

Comments Dr Sulcas, "More of this type of crime will take place unless management exercises far greater supervision over the activities of computer departments.

"Computers," he emphasises, "have not taken over the world and can be controlled. Computers are as honest or dishonest as the people who feed information into them."

INTERNATIONAL NEWS IN BRIEF

Univac $5m German order

TWO contracts for 1100 systems, each valued at $5 million, have been received by Univac in West Germany.

The big Deutsche Beamten-Versicherung Insurance company wants an 1100/82 to administer the 1.6 million policies that it currently processes on a Univac 1106, and the Energie-Versorgung Schwaben electricity company is getting a Univac 1100/12 for technical and administrative applications.

Arabian 'first'

BASED on a Digital Equipment PDP-11/34 processor and claimed to be the first online business system in the Arabian Gulf state, a Systime 5000 with 128K words of main memory and supporting 16 video terminals has been installed in Qatar. Customer is the Mannai Trading Company, which supplies vehicles, construction equipment and consumer durables, and offers a wide range of civil engineering services.

Supermart scans

US supermarket groups Winn-Dixie and Piggly Wiggly are to install NCR scanning systems to handle Universal Product Code marked goods in their branches. Winn-Dixie, which has 1,150 stores in the south of the US, has already converted 25 of them to scanning equipment. Piggly Wiggly, which is Bermuda's largest supermarket chain, has installed 29 NCR 255 checkout terminals, 25 scanners and four 726 in-store computers at its four supermarkets.

Breakaway

INCREASING business has prompted Square One Data Preparation to break from its parent company, Square One Computer Services, and move into more modern offices in Chesham. New equipment consisting of Univac 1700 and 1800 card machines and an Inforex 1303 key to disc system has been installed to meet demand.

Name change

THE Information Terminals Corp, the US based manufacturer of magnetic tape cassettes, has changed its name to the Verbatim Corp. The company has used Verbatim as the brand name for its range of products for several years. Verbatim products are sold in the UK by Willis Computer Supplies.

$3.9m contract

FOLLOWING an order from the California State Justice Department for two 1100/81s and two 90/80s to replace six Spectra 70 mainframes (CWI, September 14, 1978), the California state Department of Motor Vehicles has given Univac a $3.0 million four year contract for two 90/80s for vehicle registration and driver licensing. One Spectra 70/6 will be replaced and the 90/80s will run alongside two other 70/8s and a 70/55.

$5.4 million takeover

ADDING to its expansion in the information processing field, Addressograph-Multigraph has purchased ECRM of Sedford, Massachusetts for $5.4 million.

ECRM makes systems for text processing and newspaper production, including text editing and OCR equipment.

A-M recently agreed to buy Jacquard, the small systems and word processor maker.

Laser systems

AS part of a five-year development programme, all 30 stores in Publix Supermarkets' Jacksonville division are to install NCR 255/726 and laser scanning systems to handle the reading of Universal Product Code marked product lines. Publix operates over 200 food stores in Southeast US.

- ICL's Indian manufacturing and marketing subsidiaries have now been merged into a single company, and ICL has reduced its holding to 40%. The remaining 60% of the shares are widely held by Indian interests and are quoted on the Bombay stock exchange. The company is preparing to build 20036 in Pune (Poona). The ICL 1901A's built in India were manufactured by an Indian company, Bharat Electronics, in Bangalore, under ICL supervision.

THE work of up to 30 draughtsmen can be handled by this computer drafting system developed at the University of Queensland in Brisbane, Australia. Seen here with its developer, Dr Michael McLoan, a lecturer in computer science, the system is based on a graphics display unit controlled by minicomputer. The software can carry out graphics processing like shading, zooming, lettering in 10 different type sizes and drawing thick, thin and dotted lines, circles, arcs and angles.

The hardware configuration costs $A45,000 and also includes a graphics plotter and a disc drive. The software costs between $A12,000 and $A15,000. More information about the system can be obtained from Dr McLean at Queensland University.

ICL France to double payroll

THE French subsidiary of ICL is performing at least as well as the company overall and, according to managing director Gérard Maillet, ICL France intends to increase its present turnover of over 350 million francs, £42 million, 2.7 times in the financial year 1981-82.

It also plans to double the number of people it employs to 2,000.

Talking to the French weekly Ordinateurs, M Maillet revealed that orders in hand stood at about 320 million francs, 25% higher than at this time last year. This growth compares with an industry average of 12 to 15%, according to Maillet.

Commenting on the growth plans, Maillet said that they were more ambitious than those set by the parent company for its total business, but were in keeping with ICL's policy of seeking particularly rapid growth in continental Europe.

- The ICL subsidiary Down Under has reported profits up 234% at $Aust 2.25 million on turnover up 27% at $Aust 52.5 million. The dramatic turnaround in the company's performance includes turnover almost doubled over two years, while 40% of the deliveries made in 1977-78 were machines for rent rather than purchase. There are now 14 2900s, from the 2950 up, installed in Australia, and another 20, worth $25 million, on order. ICL Australia is the company's third largest overseas subsidiary, after South Africa and France, and just ahead of West Germany.
- ICL's Indian manufacturing

Munich debut

THE latest overseas company to be set up by the NRDC's Compeda subsidiary is in Munich.

Compeda specialises in marketing high technology software systems for engineering and computer aided design applications. Its principal products include Gaelic, a package for integrated circuit design, and PLOMS, a system for managing the design of complex chemical and industrial processing plant.

Simpact Systems expands in Holland and Australia

HOLLAND and Australia will be the next overseas operations centres to be set up by Simpact Systems Ltd, of Fareham. The two new franchise operations will market Simpact's range of information systems management packages, including the Prompt project management system.

In Holland, the company will be represented by Simpact Nederland BV, based at Amstelveen, near Amsterdam. The Australasian operation, Simpact Australasia Pty, will be centred at Adelaide.

The new franchise agreements are the latest developments in a growing pattern of Simpact activity overseas. In southern Africa, the group is represented by Simpact South Africa (Pty), while in Italy there is an associate company, Simpact SrL.

Although Simpact has been trading as a group for only a few years, it has already won a number of prestigious customers for its products including BP, ICL, Texaco, Siemens, Honeywell Controls, Centrefile, and the Bank of Italy.

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MARKETVIEW

By Fred Lamond

Minis offering DBMS compared

Not so long ago the word "database" conjured up a vision of ever more IBM 370/168 systems becoming overloaded with IMS/VS transaction processing throughput demands, causing their users to clamour for early delivery of an Amdahl 470V/6 or IBM 3033.

It caused some surprise therefore, when IBM announced last October a built-in database management system in the Control Program Facility of its new System 38, previously known as Project Pacific, which is offered in the UK from as little as £80,000, and at comparable prices in other European countries.

Yet System 38 is neither the first nor the cheapest (nor the most expandable) teleprocessing business mini to offer a database management system. At the end of 1978, at least three other mainframe manufacturers and three minicomputer manufacturers did likewise at prices competitive with, or well below, IBM's.

In this first Marketview of 1979, Fred Lamond discusses the reasons behind business minicomputer manufacturers' current interest in offering database management systems, and compares the leading systems currently on offer on the European market.

User support provided by	Manufacturer			Systems houses			
Manufacturer	**IBM**	**ICL**	**Siemens**	**Honeywell and CII-HB**	**SEMS**	**Digital Equipment and compatibles**	**Norsk Data**
Models offering DBMS	System 38 Model 3 Model 5	2903/40 2904/50	6.620 6.640	Level 6 Model 43, 47.53.57	SIS-T Model 200 Model 300 Model 400	DS 534 DS 560 DS 570	NORD-1[illegible]
Maximum capacities (bytes)							
Main memory	1.5M	768K[1]	128K	2M	512K	4M	512K
Disc file storage online	384M	507M	264M	1,152M	200M	1,400M	264M
Exchangeable	None	497M	All	264M	All	All	All
Off-line Storage/ Dumping Media	12Mb diskette magazines or MT	5M, 30M or 60Mb disc packs	6M, 7.5M 13M or 66Mb disc packs	5M, 33M or 66Mb disc packs	5M or 50Mb disc packs	5M or 08Mb disc packs	5M, 31[illegible] or 6[illegible] disc packs
Max number of workstations	256	100+	16	100+	16	100+	100+
Max number in simultaneous use	40	40	16	?	16	?	?
Online Communications with other CPUs: Hosts	370, 303X	1900, 2900 IBM 370	7.000 series IBM 370	Series 60 all Levels, 2000, IBM 370	None	DEC 10, 20 IBM 370	IBM 370, 3[illegible] Univac 11[illegible]
Satellites	—	1500, System Ten, 2903/2904	6.610, 6.620/40	Other Level 6, MTS 7500	—	DS 308, 340, DS 500 series VT 78	NORD-10, [illegible]
Database management system	CPF	IDMS	DBMS 600	IDS/II or TOTAL	SYMDAD	IDMS or TOTAL	SIBAS
Codasyl-compatible	No	Yes	Yes	IDS/II	?	IDMS	Yes
Display screen oriented query language	Yes	—	MASK-DBMS	INFO 6	TRIBO	?	?
Other programming languages	RPG III	Cobol, RPG II Fortran	Cobol, Fortran	Cobol, RPG Fortran	Cobol	Basic, Cobol Fortran	Cobol, PL/I Fortran, Bas[illegible]

Table 1. Leading business minicomputers with database management systems in Europe (at start of 1979) Note: 1 = 192K 24-bit words

A DATABASE management system must have two essential features to be recognised as such. Its file descriptions must be entirely separate from the application programs which access them. And any record or item must be described only once and held in a single master location for updating purposes, regardless of the number of different applications programs that require to access it.

Both these principles apply to a small business as well as a large corporation. Indeed, the smaller the business, and the fewer the number of its files, the easier it will be to integrate them into a single applications independent DBMS.

Most of the business minis described in Table 1 should be able to run a DBMS with fewer problems than those that have beset large mainframes, especially IBM 370/158 and 168 systems running IMS/VS.

Even so, any DBMS will always require a certain overhead in additional system software, main and disc storage on which to hold it, and CPU execution time in which to navigate through it. What are the benefits that justify this overhead?

The main one is a sharp economy in the time spent by the increasingly scarce and expensive applications programmers in maintaining and amending existing programs, once the files that these access have been separated from them. IBM has calculated on the basis of its large mainframe IMS users' experience that program maintenance effort is thereby cut by 75%.

On this basis, it is advising its typical System 3 users, who now employ one systems analyst and two programmers, that after conversion to System 38 and its CPF with built-in DBMS, they will be able to use only one programmer to code the systems designed by two systems analysts, thus doubling the output of new applications obtained from the same manpower team.

Since IBM believes, not without reason, that the shortage of experienced systems analysts and programmers is the main bottleneck slowing down computerisation, its interest and that of its competitors in promoting the use of DBMS techniques is perfectly understandable.

Given the general desirability of adopting database techniques for business file design in computer systems of all sizes, how do the seven leading families of business minicomputers offering DBMS systems compare with each other? See Tables 1 and 2.

From a computer expert's point of view, IBM's System 38 is undoubtedly the most interesting. It is the only DBMS mini currently on the market to have been designed from the ground as an integrated hardware/software package to run database transaction processing as efficiently as possible. Its current competitors are all either general purpose real time minicomputers or small business batch processing systems that have had TP and/or DBMS software added to an earlier software structure.

As a wholly new design, System 38 pioneers a number of new features. The "virtual store" is one. It means that not just program instructions but data remain in store after they have been called down from disc the first time, until such time as the main memory space that they occupy is required by more urgently required instructions or data.

System 38 is also the first computer of any size to implement and market a "relational" database management system. This is regarded by DBMS experts as the trend of the future, because "relational" DBMSs are constructed in the manner of two-dimensional tables with no variable length or variably recurring items on any line that cannot be fitted into a predefined vertical column.

This allows DBMS file sections and records to be more easily displayed on VDU screens for inquiry, updating and amendment, and to be more easily interrogated speedily by multi-criteria query languages.

What matters most to the user is the price at which he can obtain a transaction processing business mini that will give him the transaction throughput that he requires. If he already possesses a computer system, he will look for a system that will allow him to keep as many of his existing applications source programs and as much of his hardware configuration as possible. And all users will be interested in the growth path that is offered them as their business and its DP requirements expand in the future.

The cheapest business minis with DBMS software are currently the SEMS SIS-T series from France, and the Siemens 6.620 and 6.640 from West Germany. Both are entry level systems that are price-competitive with IBM System 34 rather than System 38. Yet both offer a DBMS packaged in their basic system software, and a display screen oriented interactive database definition, query and updating language.

Their only disadvantage is the comparatively limited growth path that they currently offer. Siemens does offer the larger 7.000 mainframe series, but it is unclear from Siemens brochures to what extent its DBMS is upward compatible with DBMS 600.

The next cheapest business minis to offer DBMS software are the Digital Equipment PDP-11 based DS 500 series, and other PDP-11 based business minis such as the MBM 7.400 series and the Systime 3000, 5000 and 6000 systems. DBMS software for these has not been written by DEC, MBM or Systime, but by US software houses Cullinane (IDMS) and Cincom (Total) and must therefore be ordered from these and installed by them. Either system will require a configuration priced at between £50,000 and £60,000 in the UK.

ICL 2903/40 systems able to run IDMS will be priced just below the basic System 38, ICL 2904/50 and Honeywell 6/43 systems at around the same price as a basic System 38.

These systems will appeal to users upgrading but how much of their existing systems can they retain?

ICL 2903 users are the luckiest in this respect. They can retain all their old peripherals, and field-upgrade any 2903 installed in the last three years to 2904 or 2904/50 specifications to run IDMS. Entry-level 2903/25 systems installed since April 1978 need to be upgraded only to 2903/40 specifications to run IDMS. All source programs in any language available on the 2903 range can be retained and only file descriptions need to be adapted to make them IDMS compatible.

Honeywell and CII-Honeywell Bull offer equally comprehensive field-upgrading facilities to Level 6 users wanting to run IDS/II on a Model 6/43 or larger system. Entry-level 6/23 users can retain all their peripherals, and 6/33 users can even upgrade their CPU to 6/43 specifications. All source programs remain equally compatible.

Honeywell's Level 6 has admittedly been available as a business mini for only a little over a year, and CII-HB's identical mini-6 for even less time. System support for both series is delegated to independent systems houses.

Users of the older Series 60 Levels 61 and 62 business minis are not offered IDS/II on their current configurations, but have to upgrade to Level 64 mainframes before they can run IDS/II. Such upgrading involves an exchange of CPUs and of some peripherals, but both RPG II and Cobol source programs can still be retained, subject to recompilation.

This is still a much less radical conversion than that facing the IBM System 3 user replacing his system by a System 38. The only parts of his old configuration that he will be able to retain are 3410 and 3411 magnetic tape subsystems, and the 5424 Multi Function Card Unit for 96 column cards.

All other hardware components, including the CPU and all his disc drives, will have to be replaced by new System 38 devices.

The need to replace all disc drives on installing System 38 is due to its reliance, like the smaller System 34, entirely on fixed disc drives, with a separate diskette magazine facility for file dumping for security purposes.

IBM claims that the elimination of the exchangeable disc pack drive will allow users to employ less highly trained operators, and dispense with air conditioning systems in many instances.

The greatest disadvantage facing the former System 3 user converting to System 38 will, however, be the much greater program conversion task that he will have to undertake. Unlike all other users in Tables 1 and 2, he will only be able to retain those of his source programs that were written in RPG II, the only System 3 language for which there is a compatibility feature on System 38. And since RPG II source programs [illegible] operand descriptions in the source code itself, this retention will be strictly temporary, as any program addressing files [illegible] be incorporated in the integrated database.

All such database addressing programs will have to be rewritten in the new RPG [illegible] language, but at least this rewriting can be phased over a period after System 38's installation.

Most commentators and [illegible] IBM salesmen have [illegible] readily that Cobol [illegible] on System 38 is [illegible] time, as it was on [illegible] System 34. This [illegible] tain. If eventually [illegible] may be only as a [illegible] patibility feature [illegible] allow former [illegible] phase the conversion [illegible] Cobol source programs [illegible] III over a period after [illegible] 38's installation.

Apart from the [illegible]

Manufacturer	IBM	ICL	Siemens	Honeywell and CII-HB	SEMS	Digital Equipment and compatibles	Norsk Data
Models offering DBMS	System 38	2903/40 2904/50	6.620 6.640	Level 6 Model 43 or above	SIS-T	DS 534 and above	NORD-10S
Is one of these an entry-level (up to £25,000) business mini?	No	No	Yes	No	Yes	No	No
If not, from which installed system of same manufacturer will users be upgrading?	System 3 Models 6, 10; 15A, 15B or 15C	2903/20 2903/30	—	Level 6, Models 26 and 63	—	DS 340 or DS 350	NORD-12
How much hardware from an earlier system can they retain?	MT drives and MFCM only	Everything incl CPU	—	All peripherals Model 33 CPU	—	All peripherals	All peripherals
Which source programs can they retain?	RPG II only	All	—	All	—	Basic only	All
With which medium to large mainframe series does mini offer compatible DBMS growth path?	Not yet announced	2950, 2956 and larger 2900 series	7.706 and larger 7.000 series?	Series 60, Level 66	None	DECsystem-20	None
Maximum disc file storage capacity (bytes) on self or upward compatible system: Without format conversion	664 M	3,600 M	264 M (6.640)	1,152M	200M	1,400M	264M
After disc format conversion but without source program conversion	—	Unlimited	Unlimited? (7.000 Series)	Unlimited	—	3,920M	—

Table 2. Field upgrading facilities to business minicomputers with database management systems in Europe, 1979

● Turn to page 22

COGARVIEW Arithmetic solution to language problem

LANGUAGE plays a paradoxical dual role in world affairs. We think of it primarily as an inclusive medium which allows us to communicate with each other and draws us closer together.

But historically it has been just as important as an exclusive medium which shuts out those who do not speak it and confines information in a restricted club.

Though we all pay lip service to the inclusive ideal of language, I suspect that we really harbour a sneaking reluctance to dispense with its exclusivity.

Why else do officials the world over so studiously ignore the claims of Esperanto as a universal second language? Why else is there such strong reaction in countries as diverse as France and Japan to the creeping universality of American English?

Why else, for that matter, has computing — by definition a science devoted to the speedy analysis and dissemination of data — had so remarkably small an impact on language? The fact is that attempts to open up the club of understanding to a wider membership have always been greeted with suspicion bordering on hostility.

I can think of few people whose jobs have changed so little over the past 100, 200 or even several thousand years as that of the translator.

The invention of the dictionary was the first major change in two thousand years of translating — and the last. In 1878 a translator used pen, paper, dictionary and his own knowledge. In 1978 his tools are exactly the same.

For computer people this should be a shaming observation, and maybe the enormous correspondence, sparked earlier this year by a series of Computer Weekly articles on machine translation, stemmed in part from this sense of neglect.

It certainly proved that there is no lack of specialists prepared to address themselves to the problem. So what is lacking? Why has so little progress been made?

Political will, and the money which it unleashes, has been lacking. Or so, at any rate, it appears. I am not prepared to assert that unequivocally though.

I don't think I am being paranoid if I suggest that work on machine translation may in fact be a good deal further forward than we are allowed to know. I have my suspicions that a fair amount of unrecorded research is being conducted under the shadow of national security, and it may emerge to surprise us.

But the very exclusivity of language is, ironically, contributing to its own downfall. The European Commission is part-way through a three-year programme of research into crude machine translation in limited fields.

Why? Because tiny language groups like the Dutch, Irish, and Danish have insisted for reasons of national pride that their tongues must be official EEC languages, and the Commission is consequently mired in paperwork, its translators increasingly desperate at their workload.

The Computer Weekly articles earlier this year revealed that the main problems involved in developing a coherent machine translation capability are well understood.

They include the prime problem of idiom and nuance; even first-rate translators have trouble with these, and no machine exists which can begin to tackle them accurately — as far as we know.

And there is a difficulty of defining for, some would say, choosing an intermediate language, or ITL to act as buffer between the source and target languages.

Interesting though the controversy was on such points, it seemed to me to be a lot too academic. I seriously doubt whether we will ever achieve accurate machine translation of poetry or psychology.

The cultural background necessary for even a partial understanding of linguistic ambiguity is enormously dense — often inaccessible even to very fluent speakers of foreign tongues who have spent years in the country where that tongue is spoken. No machine that I can conceive of could assimilate such a background.

But so what? Because machines will not be able to translate poetry, it does not follow that they will miss crucial nuances in business letters, mathematics or documents on the decline of the fishing industry.

And I am sure that, given the chance, computers could already be playing an important role in the translation of relatively precise compositions not loaded up with cultural allusions.

The point is that we should limit our short-term goals for the sake of getting some working system going. If, for instance, you are a Danish politician scanning that document on the fishing industry you do not need to feel confident about the translation of ambiguities merely to know whether the subject interests you or not. You do not even need a full translation. You need only the gist of the paper.

What computers could be doing now is pre-processing texts for translation, flagging words or phrases which did not satisfy pre-set criteria of precision, leaving the gaps to be filled in later by skilled human translators.

It might not be necessary to complete the translation in every case. Readers could scan the partially translated document and order a full translation if it was clear that the subject interested them.

It would be nothing more or less than a classic computer application — taking the burden of unskilled, repetitive work off the hands of skilled operators, leaving them to the interpretative work that really demands their knowledge and experience.

So it's a job half-done. But, in my opinion, that's an improvement on a job not started at all. We should be thinking, as one earlier Computer Weekly contributor very rightly said, of machine-aided translation, not machine translation, and worrying about the problem of nuance and ambiguity later.

As for the agonising over Intermediate Translation Language, that is a mere detail. Sure, a standard ITL is needed and its definition is important. But there's nothing like a few working systems for concentrating people's minds on standards and an acceptable ITL would emerge without difficulty once the decision was made to go ahead, on a wide enough scale, with machine-aided translation.

For what it's worth I do not see Esperanto as a suitable candidate. The only strong argument in its favour would be that Esperantists could read and write directly in ITL, thus bypassing the translation process. But that is outweighed for me by Esperanto's lack of neutrality.

I disagreed with the claim by one earlier correspondent that Esperanto had "no culture." For me it is the very existence of a culture that makes Esperanto unsuitable as an ITL; all the objections about ambiguity and cultural nuances begin to apply.

What's wanted is a totally abstract language chosen purely for its logical applicability. On these grounds, I would personally incline towards an arithmetical solution.

Canadian customer

ONE of the latest customers for ICL's recently announced 9500 series of retail equipment is the Canadian fashion retailer Dylex, which has ordered 200 ICL 9512 point-of-sale terminals and 170 magnetic data recorders.

CORAL NEWS

Coral News appears every quarter to provide users with up-to-date information, news and opinions. Items for inclusion should be sent to the Coral Press Co-ordinator, The National Computing Centre, Oxford Road, Manchester M1 7ED.

Standardisation:
A draft British Standard for CORAL 66 has been issued by BSI and is available at £1.50 from their office in 101 Pentonville Road, London N1 9NQ. The standard incorporates comments made on the MOD Official Definition — the Blue Book. CORAL 66 has been accepted by ISO as a candidate for international standardisation and they are circulating the draft for international reactions. UK comments should be sent to P. S. Walls of BSI at 2 Park Street, London W1A 2BS, before February 28.

Availability:
CORAL 66 is among the original compilers available on the newly released CTL 8040. This mini computer system is the latest model to be announced in their 8000 series of mini computers and lies between the 8030 and 8050 systems. Perhaps of more significance for CORAL is its availability on the 32 series mini computers released by the American Company SEL. In this case, SEL claim that the compiler has significant enhancement beyond IECCA requirements but these extensions can be disabled at run time so that the facilities available conform to the official language definition.

Books:
There has been further favourable press comment for John Webb's CORAL Programming published by NCC at £5.00. Also published by NCC at £5.00 is a course in CORAL 66.

Training:
Courses in CORAL 66 are regularly offered by several organisations including John Bell, CEDS, Ferranti, GEC, NCC and SDL. NCC's Real Time Program Design course was developed for the CORAL 66 Group and runs for 2 weeks starting 19 February and 4 June.

MASCOT:
MASCOT — Modular Approach to System Construction, Operation and Test — is an integrated approach to design, implementation and testing of real time parallel processing software based on a form of modular decomposition.

Development is being controlled by a joint Industry — MOD group with major work packages being undertaken by software houses including CAP, Software Sciences Limited and Systems Designers Limited. SDL's new CORAL compiler for IBM 370 machines caters for MASCOT Programming for OS users.

The British Army is now able to take Coral 66 into forward battle areas. The language has been used by Systems Designers Limited for the development of a management system for tactical communications.

Battle Commanders depend on reliable and efficient communications in order to control their resources. The effectiveness of the British Army's trunk communication system, Bruin, has been improved following SDL's collaboration with MOD, RSRE and the School of Signals at Blandford. Greater efficiency has been achieved through Bruin MIS — a communications management information system that releases capacity otherwise used for network control and reconfiguration.

First appearing in 1968 Bruin provides automatic voice and message switching and can adapt to the changing conditions of a tactical environment. The nodes of the system may be static or they may be located with mobile units. Enhancements had meant that its management system was encroaching on its communication channels which are its prime function. An automated management system was needed with hardware that was compact and could withstand the rigours of battle.

The basic sub-system is a microprocessor supporting a keyboard, a VDU and a magnetic tape cartridge. Additional devices may be added such as floppy discs, printers and even further processors.

The microprocessor unit consists of an Intel 8080 with 128K bytes of core and twelve full duplex communication channel interfaces. The cartridge has 4 tracks which each have a 450K byte capacity.

Particular features include failure recovery, protocols to avoid message loss and data ownership that only permits amendments to data by the originator. The system incorporates a flexible database system. Apart from the obvious defence application, the system has capabilities for police, fire and ambulance.

CORAL APPLICATIONS
Software Sciences has landed the contract to provide a computer system for Air Traffic Control at Prestwick in Scotland. The contract worth £3 million has been placed by the Civil Aviation Authority and the system will eventually control air traffic over the eastern half of the North Atlantic. As requested by CAA the real time programs will be written in CORAL.

Three versions of CORAL 66 have been compared by Real Time Developments Limited of Farnborough. They have examined the HPAC, SDL and DEC compilers which are available on PDP 11's operating under RSX 11. Their report includes sections on comparisons of features, deviations from official definition, additional features, libraries, de-bugging facilities and benchmark test results. For more information on the 100 page report, ring Real Time on Farnborough (0252) 46213.

Among significant British work which is being done on multi micros, CORAL 66 is featuring in two research projects which are based on Intel 8080's. In Swansea University College are linking six micros and RSRE at Malvern are investigating Asynchronous bus linking.

Digital Equipment have announced version 3 of their Coral 66 compiler for PDP 11's. Version 3 operates in RSX-11M, RSX-11D and IAS.

SDL has won a development contract from Control Data who aim to make a Coral 66 compiler available for its giant CYBER 170 range. The compiler is due for completion in April 1979.

The International Aerospace exhibition and flying display at Farnborough included a military version of the Ferranti ARGUS 700 which is the first in a series developed in conjunction with the Ministry of Defence. Software support for the M700 is based primarily on the standard civil CORAL 66 compiler. The ARGUS instruction set was designed with CORAL in mind which makes programming particularly efficient.

Another militarised version of a micro computer is MIPROC 16M introduced by Plessey Micro Systems. The MIPROC has a processing speed which exceeds 3.8 million instructions per second and in the same time can transfer up to 10 million words.

CORAL 66

Phone phreaks claim to beat AT&T security

FOR some time there has been an argument about telephone tapping between the US telecomms giant AT&T and the phone phreaks, those persons who obtain unauthorised use of the telephone system (CW, November 9, 1978). AT&T says that it is impossible for outsiders to tap lines, while the phone phreaks say that certain exchanges make this easy to do — once you've got a blue box, the device that simulates the switching signals used by telephone company operators.

The technical term for the AT&T facility that permits operators to tap into a call is "autoverify." This feature is used, cautiously, by the telephone company to enable operators to interrupt a call during emergencies or to determine whether a line is functioning properly. According to AT&T, autoverify facilities are designed with privacy in mind, and the procedures required of operators using autoverify supplement electronic safeguards built into the phone company's equipment.

The phone phreaks contend, however, that the security features are inadequate in many cases and the telephone equipment permits access to autoverify circuits from ordinary telephones through the use of a blue box. To prove their point, the phreaks have just published instructions for finding and using an autoverify circuit. The instructions were printed in TAP, the newsletter of the American technological underground.

According to the TAP article, some telephone company apparatus is subject to unauthorised usage. Certain telephone exchanges will connect operators — or phone phreaks — to autoverify circuits if they are reached via a tandem. A tandem is the computer used to control intercity and international telephone lines.

According to the TAP article, a phone phreak can determine the proper number sequence to reach an autoverify circuit by gaining access to a tandem and then testing out various prefixes — the operator's equivalent of area codes — until certain signals are heard. The number that follows the code must be carefully selected to reach the autoverify facility. The TAP piece suggests that a phone phreak can afford to make mistakes while trying to connect to an autoverify circuit — after all, the calls are free.

Sometimes an autoverify circuit will stay connected for only a short time, according to TAP, and on other occasions the phreak will find that the conversation he listens to is scrambled. But every once in a while the phreak will be able to listen in on calls through the supposedly secure facilities of AT&T.

NEWS FROM AMERICA BY HESH WIENER

Japan poised to win bigger markets

JAPAN's future in the computer business "is a central issue for the future success of the US computer industry", according to a leading US computer industry analyst, Gideon Gartner.

Gartner also believes that ongoing relationships between US suppliers of plug-compatible machines and Japanese manufacturers are just the first wave of Japanese penetration of the US market.

Gartner is the main computer industry analyst at Oppenheimer and Co, the Wall Street stockbrokers. He has just visited Japan and believes that the Japanese will sell nearly twice as much data processing equipment in America as their official government forecasts indicate.

The official forecast calls for $1,700 million in computer sales to the US by 1985, but Gartner calculates sales will actually reach $3,000 million. This, he points out, will be 35% of the total volume of the Japanese computer industry.

Currently, Japan's computer manufacturers are selling mainframes that compete directly with those made by IBM. So far, this is being done by arrangements between Japanese companies and US manufacturing or marketing organisations. Itel markets IBM-compatible mainframes made by Hitachi, for example, along with systems built by America's National Semiconductor. Fujitsu manufactures assemblies used in the production of Amdahl computers.

Other links exist between Japanese companies and manufacturers of equipment that is not directly compatible with IBM's offerings. Examples of such arrangements include the pact between Siemens Fujitsu (which will yield machines similar to IBM products), technology exchange agreements between ICL and Hitachi, similar exchanges between Honeywell and both NEC and Toshiba, and financial ties between Univac and both OKI Electric and Mitsubishi.

The Japanese will not necessarily continue to restrict their activities to partnerships with companies from other nations, however. Independent computer marketing efforts could follow the Japanese success in the microprocessor and memory chip business, the increasing sales of Japanese peripherals and the growing Japanese penetration of their office equipment markets.

Eventually the Japanese may become strong competitors in a full range of data processing equipment and related products.

This eventuality, according to Gartner, confirms "the validity of IBM chairman Frank Cary's apparent preoccupation with Japanese technology and management acumen."

Nevertheless, IBM Japan remains the largest computer exporter in that nation, a fact that must concern native manufacturers.

The Japanese, who have already demonstrated their ability to develop hardware, must catch up in software if they are to become a major factor in the computer industry. Gartner states that the Japanese will soon be able to develop good software, although they cannot yet equal that of American companies.

However, Gartner expects the Japanese will try to use electronics in lieu of programming wherever possible. As software costs skyrocket, this strategy may pay off handsomely.

DEC gives 11/70 to museum

A TIME sharing system based on a PDP-11/70 has been presented to Boston Children's Museum, by Digital Equipment. The museum, which features exhibits that visitors can use, rather than merely look at, is already using more computers than any other American museum. The 11/70 will be coupled to the museum's older 11/45, now used to provide a series of programs and interactive exhibits that have been bringing children in touch with technology for more than five years.

The DEC machine is the largest single gift the museum has ever been given, and museum director Michael Spock said it would be "a cornerstone of our new headquarters." The museum is to move to a new waterfront location next July.

Spock, director of the Children's Museum, is a son of Dr Benjamin Spock, famous for his book on child care and for his active protests against the Vietnam war.

Among the applications for the minicomputer will be a public-access database of cultural events, maths games and self-instruction programs. Software will be based on the UNIX operating system developed for the PDP-11 machines by Bell Laboratories.

DBMS comparison

● From page 20

language, RPG may well remain the only language in which System 38 users can write programs to process DBMS files.

How much of a compatible growth path do the various competing systems offer, especially in database file storage capacity on online disc backing storage?

Not unnaturally, the shortest growth path is on the cheapest system — SEMS' SIS-T series, limited to a maximum online disc capacity of 200M bytes. Norsk Data follows with 264Mb on the NORD-10S; this is also the maximum capacity of Siemens 6.640 disc files, whose users may be able to upgrade to the larger 7.000 mainframe series if its DBMS is compatible.

After this, however, the next least expandable DBMS business mini is the new IBM System 38, despite its comparatively high entry level price. Its maximum file capacity is currently 384 Mbytes. This may be raised in the future.

This compares with maximum online file capacities of over 1 billion bytes on both Honeywell's Level 6 and DEC's DS 500 series. The ICL 2904/50 is limited to a current maximum online capacity of just over 500M characters, but a fully machine code compatible ICL 2956 mainframe running under DME-2 could offer up to 3,600M characters of online disc storage.

ICL, Honeywell and DEC offer even greater database expansion capability on the larger 2900 series, Series 60 Level 66, and DECsystem-20 mainframes respectively. Upgrading to these systems will involve, in all cases, a recreation of disc files to conform to a different data structure. After that format conversion, however, ICL and Honeywell DBMS growth facilities are virtually unlimited.

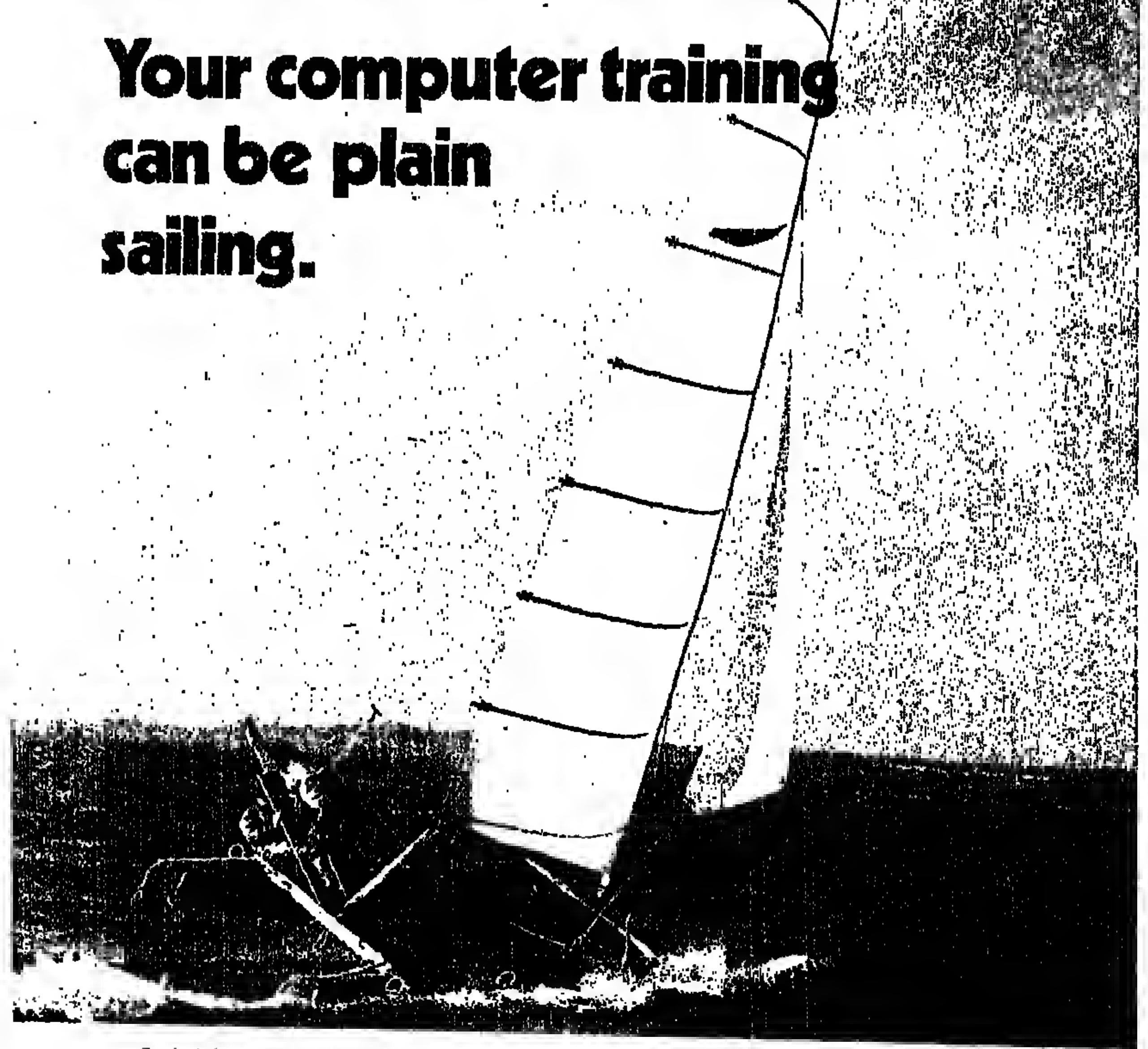
So far we have considered only the needs of the small business user requiring a single DBMS business mini at his company office. How far can these systems meet also the needs of larger companies requiring a distributed database processing network? This depends on their CPU-to-CPU online data communications facilities.

SEMS' SIS-T is the only DBMS business mini not to offer online data communications with a host IBM 370 or 303X series system. But whereas the IBM System 38 is limited to this one host family, the other five systems offer at least one other compatible host computer family.

ICL, Siemens, Honeywell/CII-HB, DEC and Norsk Data business minis can also exchange data online with other systems of their own family, as well as with smaller models made by the same manufacturer.

Neither the IBM System 38 nor the SEMS SIS-T currently offer this facility. Nor is there any guarantee that either system will offer such facilities in the future.

In the case of System 38, this omission may be designed to prevent IBM General Systems Division's System 38 from competing against the Data Processing Division's 8100 Information System designed precisely for such network applications.



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digital

Progress has been made in developing a decision model for deciding whether distributed processing represents the best organisational approach for a firm in terms of meeting objectives and making optional use of hardware, software and personnel resources. MORRIS EDWARDS describes a preliminary model developed at the MIT Sloan School of Management.

Distributed processing: A model for decision

By Morris Edwards

ADVANCES in software and mini/micro technology have removed many of the economic and technical constraints to implementing distributed processing systems. One major obstacle remains, however, and it deals with management.

Specifically, it is the lack of recognised guidelines for deciding if distributed processing represents the best organisational approach for a firm in terms of meeting its objectives and making optimal use of hardware, software and personnel resources.

Now, at last, some progress is being made in developing a decision model to handle this issue. Working at the Massachusetts Institute of Technology Sloan School of Management, Dr John Rockart, director of the Center for Information Systems Research, and his colleagues have developed a preliminary decision-making model based on interviews with more than 20 organisations and analysis of numerous other case studies.

While the model relies mainly on qualitative methods of evaluation, its framework could form the basis for a subsequent quantitative means of deciding the centralisation / decentralisation issue.

For his model, Dr Rockart divides the data processing functions into three processes: systems development, systems operations and systems management.

Systems development is defined as the process of designing and implementing new computerised systems; systems operations is considered the process of "running" the systems, including accepting current input, updating the appropriate files/databases and generating reports; and systems management is viewed as the setting of strategy, planning, establishing standards and similar activities.

Since each process is an independent one, the decision to centralise or decentralise can be made independently for each, and Dr Rockart strongly recommends this approach. "We feel that an organisation should not decide at any one time whether to centralise or decentralise its entire information system function," he states.

He believes that a series of decisions should be made on individual parts of a firm's system. "In this way, several decisions can be made, based on detailed analysis of relatively independent subsystems. Handled in this manner, each decision can be fully researched and the logic of the decision clearly understood."

Systems development and operations lend themselves to this approach since the processes involved can be performed in disparate ways for different subsystems. However, the MIT team feels that systems management, in contrast, must be viewed as an individual, integral entity, so the decision on how to manage data processing should be a single determination covering the entire organisation.

For systems development and operations, the MIT model breaks down the centralisation/decentralisation decision by grouping applications with common characteristics and requirements into Logical Application Groups, Figure 1.

"Because LAGs are relatively independent in both data and areas of concern, it is possible to treat each one separately," explains Christine Bullen, assistant director of the Center for Information Systems Research.

The final partitioning of the decision deals with organisation structure. One LAG may concern several sub-units, and when these differ in nature and characteristics, a separate decision can be made for each.

Having gone through these steps, one can determine how much centralisation or decentralisation is appropriate for a specific systems management process for a defined group of applications within a chosen organisational sub-unit.

The decision is made by developing alternative hardware and software configurations and evaluating them in terms of cost, time and effectiveness. To limit the range of alternatives, however, Ms Bullen recommends first determining the "effective range of solutions."

For this determination, systems development and operations are further divided into sub-processes and resources. For instance, systems development encompasses four major sub-processes, or activities: functional design, detailed specs and programming, implementation and maintenance.

"It is not necessary that each sub-process be centralised or decentralised to the same extent," Ms Bullen notes. "Yet, these sub-processes are interrelated and must be considered in conjunction with each other." For systems development activities, the major resource is considered personnel, since items such as equipment and budget are far less critical.

For systems operations, the sub-processes are: editing and control, updating, processing and reporting. Hardware, software and personnel are defined as one major resource since all must be centralised or decentralised together; the second major resource is the organisation's database.

Within the MIT model, decision tables are used to specify the sub-processes and resources involved in each decision and to graphically represent the range of alternative configurations appropriate for each.

The second decision-making tool, and one of the more innovative elements of the model, is a "factor table," which is based on the notion that certain universal conditions and factors influence the decision toward or away from centralisation.

From their empirical studies, the MIT team found the major factors influencing the centralisation/decentralisation decision include the characteristics of the organisation, its data processing department and sub-units, and the characteristics of the LAG and its processing phases.

In the factor table, the first two columns identify the organisational or functional level to which a set of factors apply and the factors themselves. The next column indicates the direction which the factor implies (centralisation or decentralisation) and the strength of the factor. Finally, the last set of columns indicates the sub-processes or resources to which each effectiveness factor applies, Figure 2.

Visually, a circle is used to indicate a factor that favours centralisation, with a square representing factors favouring decentralisation. Similarly, the strength or weight of the factor is indicated by large and small circles and squares. Finally, for critical factors, the circles or squares are filled in.

In the final step, the alternatives are evaluated using three major performance measures: the cost of performing the process; the time to develop and implement it; and its effectiveness.

Having determined the effective range of solutions for its basic unit, the decision-maker is in a far better position to generate the alternatives for evaluation.

Overall, in their case studies of numerous organisations, the MIT researchers have found a major trend toward distributed processing created by application-related factors which favour decentralisation by the availability and cost effectiveness of the required hardware and software, and growing user sophistication.

Meanwhile, the MIT researchers are studying the factor table to identify which key factors are present in the majority of cases, and which cause the decision to turn one way or the other.

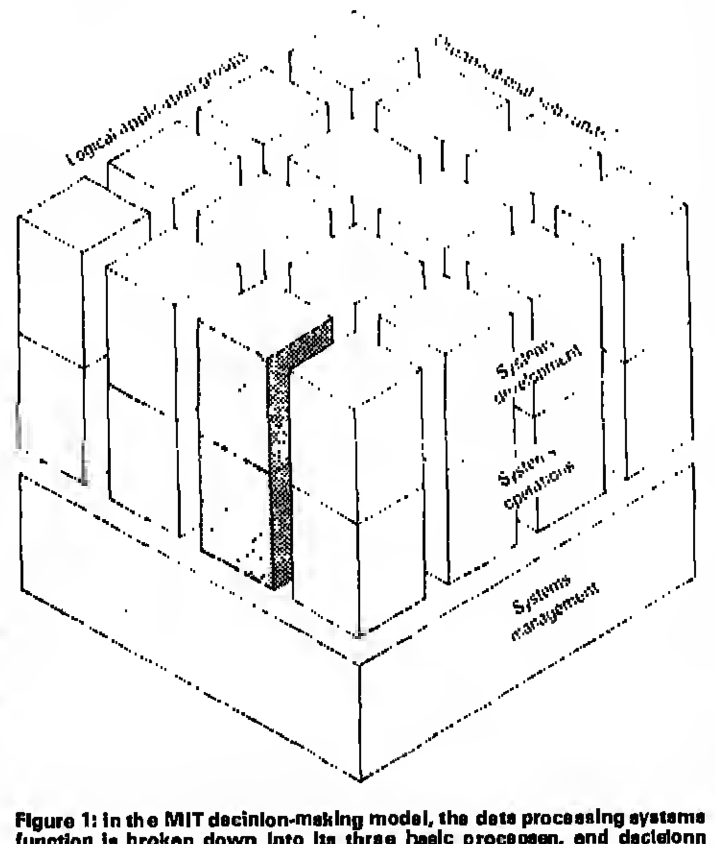

Figure 1: In the MIT decision-making model, the data processing systems function is broken down into its three basic processes, and decisions concerning systems development and operations further partitioned along the lines of common applications and organisational sub-units.

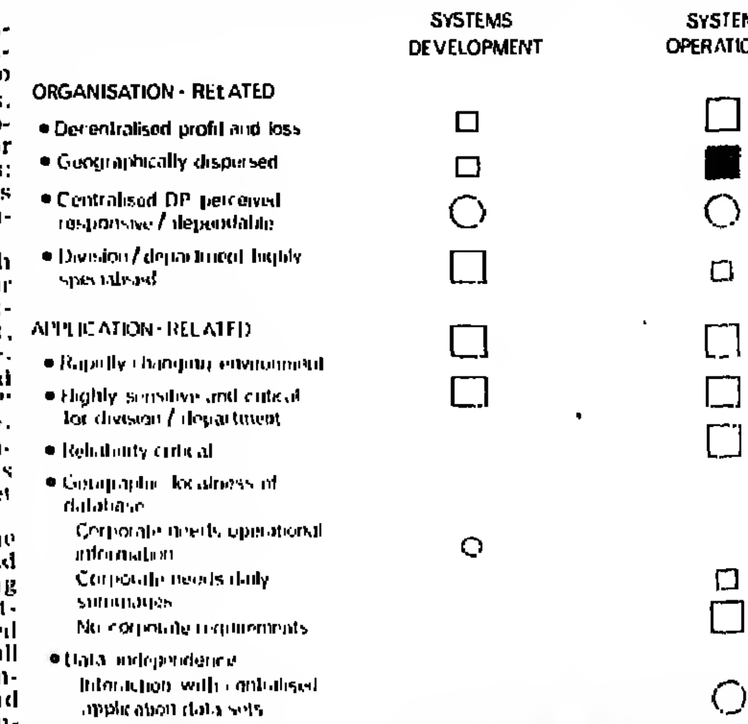

Figure 2: In this simplified factor table, squares indicate factors favouring decentralisation, while circles represent factors favouring centralisation. How strongly the factor impacts the overall decision is represented by large and small figures. With critical factors, the circles or squares are filled in.

● Firms interested in working with the MIT team on this project should contact its director, Dr John F. Rockart at 50 Memorial Drive, Cambridge, Ma. 02139.

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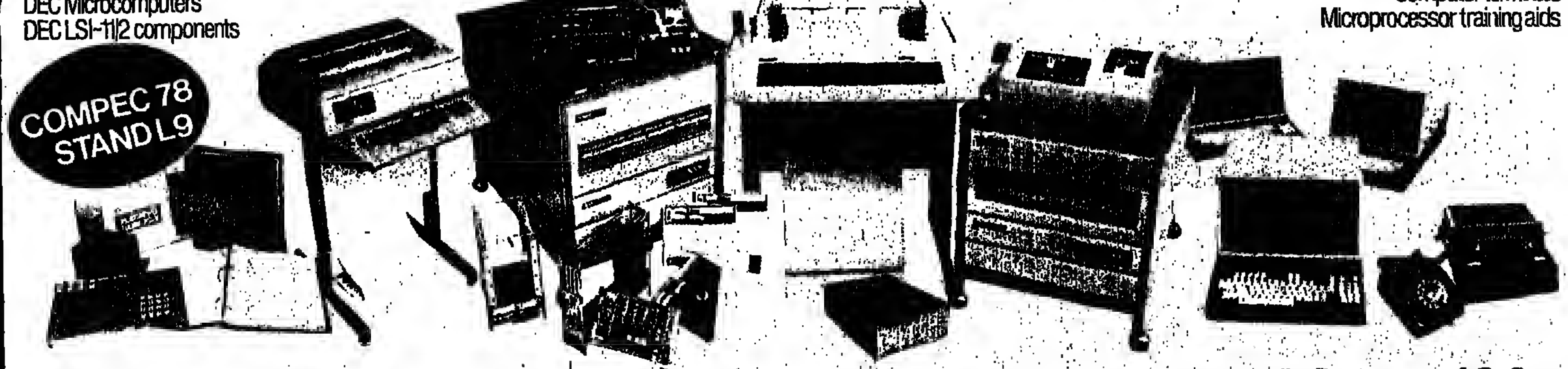

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INTERNATIONAL NEWS IN BRIEF

CDC scores in France

UNDERLINING the potential of the large-scale Control Data Cyber 170 series mainframes in commercial as well as scientific applications, CDC has scored a major victory over NCR in France. The regional agricultural credit bank in Bouche-du-Rhone is to replace its NCR Century 300 mainframe with a dual-processor CD Cyber 174.

Yugoslav contract

A MAJOR contract for NCR Criterion 8500 mainframes has been placed by the Associated Commercial Bank of Sarajevo in Yugoslavia. The order includes nine Criterion V-8500s, 151-8250 small business computers, 530 counter terminals and 140 back-office terminals, to be installed throughout the bank's 22 branch network. The system is to handle customer accounts, foreign exchange and loan processing.

Korean distributor

DISTRIBUTION of the Honeywell Level 6 line of minicomputers in Korea is to be handled by Gold Star Co of Seoul, the company which recently entered a joint venture with American Microsystems, under which AMI will design integrated circuits for use in Gold Star electronic entertainment and domestic appliance products (CW, August 10, 1978).

In-house software

JAPANESE computer users are increasingly resorting to in-house application software development. In survey conducted by the Japanese newspaper Nippon Keizei Shimbun, 236 large Japanese companies were polled and 72 per cent said that they now developed their software in-house, and the average Japanese installation now employs 150 computer-related personnel, including 74 programmers and analysts.

DG profits up 42%

IN the year to September 30, 1978, Data General made a net profit of $40 million, up 42 per cent, on turnover up 47 per cent at £380 million compared with the same 12 months of 1977.

Greek exchange

STORED program controlled telephone exchange equipment has been ordered from Thomson CSF by the Greek PTT for its transit exchange in Athens. Worth £2.2 million, the MT 20 system will be installed next year, and will come into service in early 1980.

Major expansion of DP space at Hanover

A MAJOR expansion of the exhibition space for computer equipment is under way in preparation for the 1970 Hanover Fair. The CeBIT section of the show, which houses office and data technology, will occupy three halls instead of the usual two. The additional location is Hall 2, which joins the enormous Hall 1 and the smaller Hall 18. All three will be linked with first floor level covered walkways.

Software and services companies will be exhibiting in force at Hanover for the first time, and over 30 have already booked space, most of which will be housed in Hall 18.

The other main feature of the show this year will be the automated office, a joint presentation by all CeBIT exhibitors designed to "reduce the disquiet" among members of the general public about the widely forecast revolution in office methods and systems. According to the organisers, the beneficial changes in "social, income and working conditions" will be stressed.

The show opens on Wednesday, April 18 and closes on Thursday, April 26, 1979. The organisers are investing 30 million Deutschmarks in improvements to the fairground.

● Meanwhile the organisers of Europe's other big data processing and office equipment show, the Paris-based Sicob, report that over the opening three "professional" days, attendance was up 14 per cent, foreign visitors were up 8 per cent and the total attendance was 200,628. Sicob 1979 will run from Wednesday, September 19 to Friday, September 28.

Powerful line-up of mainframes for plum Australian contract

THE world's most modern and most powerful general purpose mainframes are lining up to compete in a re-run of the contest for the plum contract for the Australian Bureau of Statistics. Fujitsu won the contest last time around, but had the prize snatched away following lobbying of the government by IBM Australia — an outcome exclusively forecast in Computer Weekly International (November 10, 1977).

The contest is a particularly significant one, because Australia is the only developed computer market where all the world's major mainframe manufacturers apart from Siemens compete head-to-head.

However, there is some doubt about ICL putting in a bid. A spokesman said that the company would not spend on making a bid unless it felt it stood a good chance of winning. NCR is also not expected to bid, the main reason being that its new 8600s will not be ready in time.

The new tender specification is for equipment worth $A20 million, about £12 million, to replace the Canberra-based bureau's CDC 6600. The requirement is for a minimum two processor machine with about 10 Megabytes of main memory, 20,000 Megabytes on disc, and an on-line bulk storage system with at least 168,000 Megabytes of storage.

The ability to upgrade the installation is a key requirement, and both IBM and Fujitsu will be offering machines not available at the time of the last round.

Fujitsu bid the M-100 last time, and IBM the 168. Fujitsu should still have the edge in that the M-200, being available in configurations up to four processors, is more flexible than the IBM 3033, which comes with one or two CPUs, and offers no cost advantage in the dual processor version. It is thought possible that Fujitsu might bid the new Amdahl 470V/8 as well as the M-200, but to do so would be a new departure, since Amdahl has not hitherto offered multiprocessor configurations.

Newcomer to the bidding will be Hitachi, through Itel, with the AS/6 version of Hitachi's M-180.

Univac will be bidding the 1100/80, Burroughs the B7800, Control Data will probably offer the Cyber 176, although the new Star-100A is a possibility, and a Honeywell bid would be based on either the Level 68/DPS Multics system or the Level 66/DPS.

The bids must be lodged within about three months.

Eclipse system aids oil search

The largest model in the Data General Eclipse line, an M/600, has been installed by the Woodside Petroleum Development Pty in Perth, Western Australia, to take over the online digitising and plotting of seismic data collected from the North West Shelf in the Indian Ocean. The shelf is a source of both oil and natural gas, and the processing work was previously done at several computer bureaux. Our picture shows operations on board the Woodside derrick, in the Indian Ocean.

Asian scripts on Tally printer

A PRINTER specially designed to produce Middle Eastern and Asian scripts has been introduced by Tally. Called the T5000 Expanded Matrix printer, it is a modified version of the established T5000, and uses the same hells and hammer print mechanism.

The difference between scripts like Farsi and our own alphabet is that the characters are linked together, and the shape of these links affects both the meaning of words and the grammar. This linking means that devices which print clear-cut characters can only handle a limited range of meanings.

Tally has overcome this limitation by developing a special matrix 14 rows deep and 15 wide. Each matrix immediately adjoins the next to give a printing area which is continuous across the page. The characters themselves are slightly larger than in the standard T5000, with 110 characters across the page instead of 132, and four characters to the vertical inch instead of six. The output speed is 200 lines per minute

Although specially designed for the Middle East markets, the qualities of the printer make it suitable for almost any alphabet, and also for graphs, music or printed portraits. New character sets can be specially produced at a cost of a few hundred pounds, in a few weeks. They are stored within the printer on a read-only memory.

The T5000 Expanded Matrix printer will be sold to end-users for less than £5,000, with discounts for quality orders.

Carter crackdown on cheats

PRESIDENT Carter and members of his cabinet have expressed warm praise for three US government projects that are tracking down cheating and fraud against welfare programmes by matching up personal records on separate computer systems.

According to the President, many millions of dollars are already being recovered from the estimated $7 billion lost annually to welfare cheats, dishonest doctors and pharmacists, and defaulters on student loans.

Carter was speaking at a conference on Fraud, Abuse and Error organised by the Federal Department of Health, Education and Welfare.

There are three anti-fraud computer projects running at the moment: Project Match, which is tracking down government employees who are illegally receiving social security benefits; Project Integrity, which is aimed at dishonest health service providers under the federal Medicare and Medicaid programmes; and Project Cross-Check, which is chasing those who have defaulted on repayments of student loans.

Helsinki $6m order for Univac

KESKO OY, the Finnish wholesale corporation, has installed a Univac 1100/82 to handle its inventory control, warehouse operation, and statistical work and forecasting applications.

Valued at about $6 million, the order was placed with Oy Saab-Univac AB and the 1100/82 is sited at Kesko's Helsinki headquarters.

This latest system is in addition to two Univac 494s acquired by Kesko over the last 12 years, together with 195 Univac UTS 400 terminals and two Distributed Communication Processors.

Additions to Modcomp line on the way

AT the last count, Fort Lauderdale minimaker Modcomp had sold 75 of its new Classic 7860 line of minicomputers, 30 per cent to customers new to Modcomp. Two of these, Honeywell and Harris, have competing minicomputer lines of their own.

According to president Ken Harple, further additions to the line will be made shortly. There are currently three models, the one Megaword 7870, the 7860, and the compact 7810.

Modcomp is currently being wooed by two unnamed companies — a large multinational wanting to acquire the entire company, and a private US company wanting a 20 per cent stake.

Cybers for Finnish weathermen

WEATHER forecasting on a global scale will be improved shortly by the acquisition of a Control Data Cyber 171 and two Cyber 18-30 units by the Finnish Meteorological Institute.

The 171 will run a large scale weather prediction model which will be linked in via the mini to the World Meteorological Organisation's network. Eventually it will be connected to the giant Cray 1 system at the European Medium-Range Forecasting centre at Shinfield Park, Berkshire (CW, January 12, 1978).

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New Year—New Jobs

A paradox of the present levels of unemployment is that the DP industry is crying out for liveware. In this article, Computer Weekly International Editor Tim Palmer suggests that one of the reasons for this is the lack of a clear-cut path to a DP career, which probably starts with lack of information at the school careers advisor level.

He says the New Year is a good time to take stock of one's lot and consider looking elsewhere. On this point, Palmer urges job applicants to look beyond big salaries — these can be taken for granted — and consider what else a new job can offer.

Now is time to ask: 'Am I being paid enough?'

AT a time when all the forecasters agree that unemployment is more likely to rise than to fall in the medium term, the computer industry presents a striking paradox: why is it — at a time when so many people are looking for jobs in an occupation apparently well paid, not demanding a long and complex education and attractive in terms of challenge and status — so chronically short of staff?

One of the reasons clearly is the very informality of the computer industry: there is no clear-cut educational path that leads to a career in the computer industry. At any DP managers' convention, accountants rub shoulders with physicists, classicists with electronic engineers.

The universities were slow to offer computer courses and, when they did, acceptance was hampered by a general feeling within the industry that on-the-job training was more valuable than formal education.

This is no longer true, and the colleges which offer computer courses are now turning out graduates capable of being usefully employed almost as soon as they start.

But old prejudices die hard, and the last person to hear about changes in the profile and requirements of the employment market is lamentably often the man or woman saddled with the title of careers adviser in addition to his or her normal duties.

The fact remains that the requirements for entry into a computer-related occupation are so open and ill-defined that the case for a computer career often goes by default.

Yet the requirement for people capable of applying the microprocessor promises to make even worse the already dangerous shortage of skilled computer people. In the short and medium term, the shortage is beneficial to those already in the industry; in the long term it spells potential disaster.

Computer manufacturers, waking up to the problems users encounter in finding, and meeting the cost of, trained staff, are going all out to make computers easier to use, and, more significant, easier to program.

The plummeting cost of hardware is making this a more and more cost-effective approach to the problem, but its long-term effect will be that fewer skilled analysts and programmers will be required. Systems may be more inefficient, less elegant, but their overall cost will be lower.

The New Year is a time for resolutions, new beginnings, a period for reflection, for re-examination of motives, needs, desires, requirements. A time to ask difficult and self-searching questions — and a time when many people think seriously about looking for a new job.

Most of us flip idly through the cornucopia of job opportunities which bounces onto the doormat with such profligacy each Thursday: Am I being paid as much as I am worth? Could I apply my skills and experience in a more challenging and profitable way?

Now is a splendid time to ask those questions in earnest, to seek fresh woods and pastures new, and this week's crop of job opportunities is well up to standard.

But if, as computer professionals, we accept the fact that the desperate shortage of trained people threatens our own careers by hastening the day when the servant becomes master, the machine assumes the power to make us redundant. It is incumbent on us to ask prospective employers more searching questions than is usual.

In our highly-taxed world, the fringe benefits, the assistance with removal expenses, help in finding somewhere to live are all vitally important; but, in the seller's market in which any computer person worth his salt resides, they can be taken almost for granted.

But what is the prospective employer doing about helping to solve the problem of too many jobs chasing too few people?

Does he have his own in-house training scheme to develop existing members of his staff who show aptitude or promise? Does he encourage or frown upon time off for further education and career development?

How will he react if you say you feel the need to learn more about programming micros, about designing micro systems? Is he indeed aware of, has he thought about, the likely impact of the microprocessor and the information technology revolution on his business as a whole?

The government is devoting much money to education in and projects on the application of microprocessor technology to all manner of tasks: is he in fail with the rules and regulations for getting support, has he any plans to put up proposals to the Department of Industry?

In this business above all, individuals should constantly be aware of the need to learn, to retrain, to acquire new skills.

The computer industry is peopled much more than most by individuals who have achieved distinction by practice rather than by qualifications and by book-learning: is your prospective employer the kind who promotes people solely on merit, laying stress not on formal job titles but rather on getting the best out of each individual?

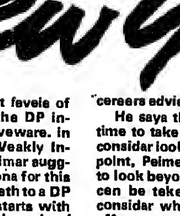
Far too many people throughout industry and commerce have rare talents and skills which are being wasted to the detriment of the organisation and the individual alike — simply because a face does not fit, there are three nonentities ahead of HIM in the promotion queue, he has a "poor track record," whatever that means, or because "we've never done it that way before."

Clearly employers who think like that, who have a tendency to go for the "safe choice", are to be avoided.

It is also worthwhile to try to have a word with a few of your prospective colleagues before you accept the job offer, to make a better assessment of the company you are thinking of joining.

The point is that concern about the industry in which we work, about the job prospects, training opportunities for others as well as ourselves, is not altruism but a vital form of enlightened self-interest.

A Happy New Year, and Good Job-Hunting!



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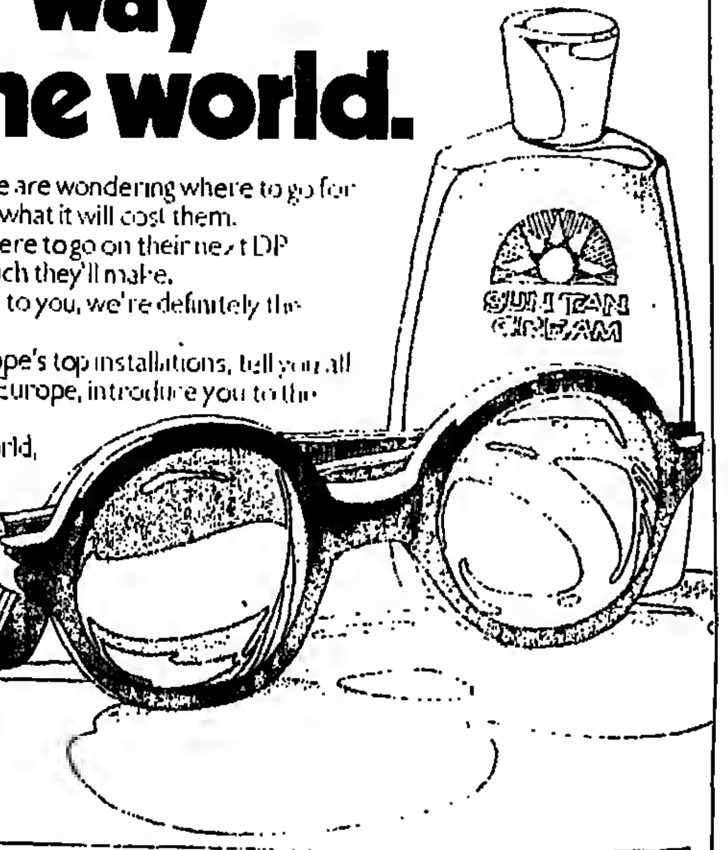

Operators

ICL 2980
VME/B Operators
with knowledge of SFL-Luxembourg.
ICL 1900 GII + GIII Operators - Middlesex + Kent.

DATA CONTROLLERS GIII site-long term contracts - Kent
IBM 370/168/158
OS/VS1, VS2 for Germany, Surrey + Worcs.

For further details or advice on these or other **UK** and **European** Contracts call Sue Smyth, June Mogg or Jane Asbury, NOW! on 01-491 4706 or 01-439 3411.

Programmers/Analysts

UK:
IBM COBOL OS – BUCKS.
IBM PL/1 DOS/OS – BUCKS.
IBM ADABAS SUPPORT – HERTS.
IBM ASSEMBLER OS – LONDON
IBM RPG II – SUSSEX
IBM DOS RPG II – NORTHANTS
IBM PL/1 OS - Herts.
PDP RSXII FORTRAN – DERBY
ICL ANALYSTS – LONDON

OVERSEAS:
IBM MVS SYSTEMS PROG - HOLLAND
IBM IMS SYSTEMS PROG - HOLLAND
HONEYWELL 6000 SYS PROG - GERMANY.
HONEYWELL 6000 ENGINEER - GERMANY.
MICRO PROCESSOR
SOFTWARE CONSULTANT – GERMANY

ICL 2900 VME/B COBOL
VACANCIES IN UK/EUROPE STARTING IN EARLY 1979 LONG AND SHORT TERM REQUIREMENTS FOR PROGRAMMERS, ANALYSTS AND SYSTEMS PROGRAMMERS.

Please contact Richard Kaluzynski, Neil Williams or Suzy Gillam: 01-491 4706 or 01-439 3411.
All vacancies are open to both male and female applicants.

Knight

Knight Computer Services Limited,
14 Old Park Lane, London W1Y 4NL.
Staff Services Division of BOC Datasolve Group and a member of Computing Services Association.

01-491 4706

JBA

Project Manager
Central London **circa £9,000**

A requirement has arisen for an experienced Project Manager to take responsibility for systems development of a Sales and Stock Accounting project in the operating company of an extremely large and diverse manufacturing group. The company is currently developing an extensive range of both real-time and batch distributed database systems, based on a network of PDP-11/70's and an IBM 370/138.
Applicants must have depth of experience in project management commensurate with the ability to control a major development project and a team of highly motivated professionals.
This is a positive opportunity to work for an excellent organisation where career prospects and the employment package are considered to be above average.
Contact: Margaret Stevens

Support Analysts
West of London **neg to £7,000 + car or allowances**

If your present responsibility is to implement commercial systems and you feel that the next challenge is to join a sales support team then our client is currently able to offer such a position. The company manufacture mini computers and has enjoyed a steady growth over the last few years, a pattern which is expected to continue into the future. This position requires that candidates have a good grounding in basic d.p. disciplines as the company market a wide range of both tailor made systems and standard packages for general commercial usage. The successful applicants will be able to work on his or her own initiative, and will be happy to fit into a small and friendly team.
Career prospects are dependent on the success of projects and resulting expansion.
Contact: Mike Cremmer

Inter–Computer Communications
Cambridge **£6,000–£8,000**

Applicants of degree level in Computer Science or Electronic Engineering with at least 3 years project experience in a University or industry are invited to consider this well established company of specialist consultants and systems designers.
Project management potential, an interest in word processing systems and a thorough proven ability in writing Assembler are required. Necessary ingredients of the consultant status will be self motivation, an innovative nature and a business-like approach with clients at all levels.
Attractive salary package and achievement bonus is offered to employees.
Contact: Mike Cremmer

PDP Programmers
London/Home Counties **£6,500–£9,000 + Expenses**

This client is a city-based software house which is continuing to attract development projects from a prestigious and growing client base.
On joining their team of Consultants, Analyst Programmers with a good knowledge of RSTS/E and BASIC + (and possibly MACRO-11) will have the opportunity to significantly contribute to the growth and expansion of this still small and versatile organisation. Self-motivation and the capacity for hard work and commitment will be extremely well rewarded both financially and in terms of increased responsibility and status.
Basic salaries range from £5,000 to £8,000 -according to experience, with bonuses and profit sharing providing around £1,500 pa extra. Each Consultant has the chance to earn a stake in the company.
Contact: Andy Wright

Support Programmer/Designers
Edgeware, Middx **£6,000 to £8,000 +**

These positions require experience of ASSEMBLER programming, preferably gained on mini or micro systems, and a good knowledge of commercial applications. The company is doubling the size of its customer support team in order to cope with the ever-increasing number of orders for its micro-based turnkey systems.
The job involves advising clients on their requirements, developing proposals, designing and writing systems, installing and setting up the completed systems, and training customer staff. A full consultancy role for self-starters with ambition and drive.
A company car could be one of the benefits - an exciting opportunity in this new area of the market.
Contact: Andy Wright

Business Systems Consultant
South London **up to £7,500**

Our client, one of the major computer manufacturers in the UK, has opportunities for Business Systems Consultants to join a pre-sales team based in South London.
Applicants should have at least four years experience in data processing with the majority of that spent in the design and implementation of commercial applications. Candidates should have undertaken feasibility studies and been involved in defining user department requirements. The Company is looking for staff with maturity, sound business background, diplomacy and the ability to meet objectives with minimal supervision.
Excellent salaries, car allowance and bonus scheme.
Contact: Jim Baker

For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

GERMANY·SWITZERLAND·BELGIUM

REAL TIME
UP TO £15,000

We specialise in real time, automation and industrial control systems. We are looking for staff experienced in these fields who enjoy a challenge, take pride in their work and wish to join a dynamic systems company.

If you are interested, please contact:
Mrs C. Ewing,
Digital Applications International Ltd.
Axtell House, 24 Warwick Street,
London W1R 5RB. Tel: 01 734 5486.

DAI

HOLLAND·MANCHESTER·LONDON

Team Leaders
Development of Simulation and Instrumentation Systems.

Marconi Radar is a leader in the field of sophisticated simulation, instrumentation and associated electronic systems.

A major expansion programme in this area has created several excellent opportunities for experienced team leaders in software engineering and in electronics.

Software appointments are being made in the very high technology field of computer generated imagery in which the software and electronics are developed together.

Senior electronics appointments are also to be made, both in CGI and in the simulation group responsible for operator and team trainers.

These positions carry attractive salaries and other benefits which include assistance with removal expenses.

You will find Leicester a thriving city surrounded by delightful countryside and where housing is still very reasonably priced.

Male or female applicants should send brief career details to

Nick Donovan, Personnel Officer,
Marconi Radar Systems Ltd.,
New Parks, Leicester. LE3 1UF.
Tel: Leicester 871331.

Marconi Radar

Holland

SYSTEMS PROGRAMMERS
£20,000 P.A.

to be responsible for all aspects of system support including system generation, development and maintenance in an OS/VS1 environment supporting IMS.

IMS SPECIALIST
£20,000 P.A.

to work within a small specialist team responsible for providing a consultative service to application development groups on all aspects of database and data communication design.

CDS is an established consultancy with offices in the UK and Switzerland. The above assignments are to supplement our existing team working for an internationally respected client in the Netherlands and will be on a 6 monthly renewable contract basis. For further information please contact Brian Bidston on 0734 791226 during office hours or on 03446 5385 evenings.

2 The Courtyard, Denmark Street, Wokingham, Berkshire RG11 2BB
Tel: (0734) 791225 Telex 847317

370 Software Support cds

Programmers/Analysts Systems Analysts

West of Scotland

Our client is a major international Company manufacturing high volume consumer products for the U.K. and European markets.

The D.P. functions close involvement in the design and implementation of a wide range of computer applications coupled with the expansion into Real Time systems has created openings at all levels in the development team.

Programmers and Programmer/Analysts

With 1-2 years commercial programming experience, and currently seeking career development into system analysis. Experience of R.D.G. II would be an advantage but is not essential.

Systems Analysts

These positions require more experienced individuals, ideally with a good grounding in programming and some experience of systems analysis in a commercial environment.

The work is varied and interesting, requiring technical expertise plus the ability to communicate effectively with all levels of management.

An excellent salary and benefit package including re-location expenses will be offered.

Applications in writing, giving full career details to Position Number PGA 899, Austin Knight Limited, 176 St. Vincent Street, Glasgow G2 5SG.

Applications are forwarded to the client concerned therefore companies in which you are not interested should be listed in a covering letter to the Position Number Supervisor.

THE HATFIELD POLYTECHNIC
Computer Centre

COMPUTER OPERATOR
and
SENIOR COMPUTER OPERATOR

We are presently installing three new multi-access computer systems to support over 200 simultaneous terminals and have two vacancies in our operations team which works on a three-shift basis. Although preference will be given to candidates with experience of DEC equipment for the senior post, the essential requirement for both posts is a sound background in computer operations.

The computers (a DEC 1081, DEC 2020 and POP 11/70) will be housed in a new building which has excellent staff facilities.

Salaries.

Senior Operator
£4433-£4918 (bar) — £5485 (AP 3/4)
Operator:
£3370-£3903 (bar) — £4338 (Clerical 1, AP1/2)

inclusive of shift and other allowances. Trainees may be appointed at a lower salary.

For further details and an informal discussion ring Gordon Brand on Hatfield 68100 ext. 407 or write to the Staffing Officer, The Hatfield Polytechnic, P.O. Box 109, Hatfield, Herts. Please quote reference 161.

Closing date for applications January 24, 1979.

Both posts are open equally to male and female applicants.

It simply isn't true that all the best computer jobs are in the South

SALES EXECUTIVE: MANCHESTER

Data Logic's Professional Services Division has over 300 consultants, analysts and programmers — providing creative solutions to practical computing problems. We are growing very fast: in size, in reputation and in the breadth of our computing assignments. We intend that growth to continue.

Our projects cover the country. Our largest regional office is in Manchester, where the client list and prospects match the dynamic progress of the Division as a whole.

We are looking for a top Sales Executive, to be based in Manchester and cover the North. He or she will sell consultancy, software and total systems based on minicomputers. Our technical staff will provide the necessary support. The Sales Executive will have to supply the energy, the coordination and the marketing knowhow. Initial remuneration will be £10,000 or over, plus a company car and other benefits. Future remuneration will depend on results. For the right person it could be considerable.

Software sales experience is essential. Experience of OEM systems sales is highly desirable, from either the manufacturer or the system supplier side.

Data Logic

A Raytheon Company

Write or call:

Jeff Anderson
Data Logic
FREEPOST
Manchester M16 8HD
Tel: (061) 872-3232

Mike Griffiths
Data Logic
FREEPOST
Westway House
120 Ruislip Road East
Greenford
Middlesex UB6 8BR
Tel: (01) 578-9111

Numerate Engineers Analysts Programmers

The System Problem Analysis Group of Ferranti Computer Systems Limited is an expanding organisation that undertakes analytical and scientific programming tasks for external agencies (in the UK and Europe) and in support of Ferranti's Real-Time System Projects:

Our Work Includes:

* Signal Processing — Sonar and Radar
* Target Tracking — Active and Passive
* Fire Control Systems — Gun and Missile
* Computer Simulation — Event and Time Based
* Scientific Data Processing and Mathematical Analysis
* Control Systems — Continuous and sampled
* Microprocessor Systems — Design and implementation

We require new and experienced graduates in a numerate discipline to take part in our future expansion. Successful applicants will be capable of:

* making significant contributions in new fields
* communicating effectively
* liaison with customers

We can offer:

* high job interest
* flexible working hours
* competitive salaries
* paid overtime and bonus scheme
* early opportunities for responsibility
* friendly, informal atmosphere

If you feel you can meet the challenge that our kind of work offers, then please ring our Recruitment Officer on Bracknell 3232, ext. 471, or write quoting ref. no. D/884/CW to:—

The Personnel Officer, Ferranti Computer Systems Limited, Western Road, Bracknell, Berkshire.

These posts are open to male or female applicants

FERRANTI
Selling technology

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datascene

CONTRACTS
PROGRAMMERS & ANALYSTS

REGISTER NOW FOR IMMEDIATE & FORTHCOMING REQUIREMENTS THROUGHOUT

LONDON ★ U.K. ★ EUROPE

DUE TO OUR CONTINUALLY CHANGING REQUIREMENTS WE ARE ALWAYS INTERESTED IN HEARING FROM COMPUTER PROFESSIONALS WITH A SOLID D.P. BACKGROUND TO WORK WITH MAJOR CLIENTS WHO ARE ALWAYS ABLE TO OFFER A WIDE VARIETY OF INTERESTING & CHALLENGING REQUIREMENTS.

REMEMBER; WE PROVIDE TOP CONTRACTS WE PAY TOP RATES

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DATASCENE RECRUITMENT LTD
Sceptre House
169/173 Regent Street
London W1R 7FB

01-439 7871
24 hour answer phone

COBOL PROGRAMMERS
European Assignments
IBM DOS or OS

PROGRAMMERS and SENIOR PROGRAMMERS ..... to £14,000

SENIOR PROGRAMMERS with CICS or IMS EXPERIENCE ..... to £18,000

Interesting Projects
Database/ Development
High Rewards (£££)
Equity Participation
Training Opportunities

Programmers with two or more years' COBOL experience are required to work on challenging and interesting projects as part of Marcol's European team who are achieving substantial successes on the Continent. Preference will be given to those applicants who have DOS or OS COBOL experience, however any mainframe COBOL programmers who are willing to undertake a three- to six-month training program in the U.K. should also apply now.

Unlimited career prospects are waiting for you at:

MARCOL Group

Total capability from the

For full details and a confidential interview please ring or write:

DEREK ASHLEY or PENNY BAILEY

60 Queens Gardens London W2 3AF Tel 01-402 9355 (24 hours)

Contract Sales Manager

Focus Computer Services Limited is one of the leading names in Contract Services to the Computer Industry. We are currently looking for a Contract Sales Manager to manage our expanding Systems and Programming Contracts Division.

This position would suit a hard-working and self-motivated person who has perhaps spent a minimum of) one year as a Contract Sales Consultant, and now feels ready to move into a more responsible position; you will have complete control of this Section with full advertising back-up.

The kind of person we are seeking will know exactly what he or she is worth — but we want *you* to tell us what you can offer *us*. Phone me now... Carl Whitlow

FOCUS
Computer Services Limited

DYNAGRAPHICS FIELD SERVICE ENGINEERS

Due to expansion IMLAC International Limited, a world leader in Computer Graphic Display Systems, are currently looking for experienced Field Service Engineers, to support their existing POS-4 and POS-1 Systems and the NEW DYNAGRAPHICS range of Graphics Terminals.

The Engineers will operate from IMLAC's Amersham office, and would be expected to support sites throughout Europe and the UK.

Applicants should have at least 2 years' Field Service experience working on mini computers and peripherals. IMLAC are offering competitive salaries, company car, and an attractive Pension Scheme.

For further information, please call or write to:
John Stock
IMLAC International Limited
IMLAC House, 17 Chesham Road
AMERSHAM, Bucks.
Tel. (02403) 22169

MYRIAD

NEW INSTALLATION

ANALYST/ PROGRAMMERS
PROGRAMMERS

N.W. LONDON **£4000-£6500**
1-4 years' experience

These positions offer positive career prospects to PROGRAMMERS and ANALYST/PROGRAMMERS seeking a greater challenge, more advanced technical experience and additional responsibility.

Having successfully computerised a number of accounting and management information systems, the Company is now making a major hardware enhancement to assist with the Group's three-year expansion program throughout Europe. Working within a small specialist team the successful candidates will have the opportunity to broaden their experience on unusual applications using the latest techniques and equipment.

Applicants should have from one year's programming experience using any commercial language and possess the potential to progress within a progressive and expanding organisation.

Ref. N1/1101

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981 (24 HOURS)

NORWICH . . . IPSWICH . . . CAMBRIDGE
COLCHESTER & BURY ST EDMUNDS

A few of the pleasant locations where there are now opportunities for experienced programmers —

ICL COBOL & RPG 11
DEC BASIC +
IBM PL1, ASSEMBLER
or SYSTEM PROGRAMMER
SENIOR SYSTEMS ANALYST
PROJECT LEADERS & IBM

operation staff also required.

Ring: Bryar Richmond Norwich 867233 or leave answerphone message at any time.

East Anglian System Ltd.
P.O. Box 70
Norwich NR1 4EF

INDALEX
Analyst/ Programmer

C £5,500 — Cheltenham

We have an ICL 2903 and EDS 30's.

We seek an experienced Analyst/Programmer (male/female) who can quickly contribute to the current projects such as on line order entry, shop floor data collection (using 7502 comms kit) and implementation of a new payroll package.

Suitable applicants, should preferably have experience of Cobol and On Line Working. This Senior Staff position carries an attractive remuneration package. Please write with brief details to Mr. B. M. Chatfield, Personnel Manager.

Indalex Limited Kingsditch Lane Cheltenham
Telephone 21641

MYRIAD

PROGRAMMER/ ANALYST

SOUTH MIDDLESEX — **c. £5000**

If you have gained one year, or thereabouts, COBOL programming experience, you may now be seeking your first move into systems analysis. This position represents an ideal opportunity for an enthusiastically person to gain comprehensive problem-solving experience in a highly user oriented role within a progressive installation. Extensive use is made of on-line programming and data communications to develop sophisticated systems.

A background on any manufacturers' hardware will be acceptable since full training is provided. A first-class sterling salary and valuable fringe benefits make this a highly beneficial career move.

Ref. SW1/1101

SYSTEMS ANALYSTS

SLOUGH — **£6000-£7000 +**

If you would like a more senior role in systems analysis than our client could offer you that move in a progressive environment.

The company is a large national commercial organisation. Analysts and Senior Analysts are required now to augment our client's expanding development team.. Current hardware comprises an IBM 370 running under DOS/VS with on-line and database capabilities.

Candidates should be able to demonstrate proven project control and implementation experience, preferably combined with a programming background. They will be given the opportunity to work with the design and development of extensive teleprocessing systems.

The excellent starting salaries offered will be further enhanced by the extensive company benefits and the opportunity for good career progression.

Ref. NW2/1101

MOVE TO IBM

SURREY — **TO £5500 + BENEFITS**

COBOL PROGRAMMERS

If you can offer two years' COBOL gained on any machine and would now like to enhance your career at one of the most up-to-date IBM sites in Surrey, then our client can fulfill your wishes. Operating large mainframes, supporting on-line program development, they are seeking to recruit programmers for their project teams working on a variety of interesting systems. The company is ready to release extensive development plans to ensure their competitiveness well into the eighties. Full training will be given and the successful applicants can look forward to possessing an in-depth knowledge of IBM OS J.C.L. and being conversant with Assembler.

The total benefits package is considerable and the air-conditioned offices are very accessible by road and rail from most places in N.E. Surrey.

Ref. S1/1101

PROGRAMMERS & ANALYST PROGRAMMERS

BEDFORDSHIRE — **To £7000**

Our client, an international organisation successfully marketing personalised communications equipment has recently embarked on an exciting programme of computerised development.

Following the installation of an ICL 2900 computer, the initial task has been the implementation of extensive financial and accounting systems for Head Office. It is now intended to link ancillary branches and associated companies to the installation to provide an on-line information service and subsequent interactive processing network.

Both programmers and analyst/programmers who have a minimum one year's RPGII experience are required to join a team developing new corporate systems with mini and micro interfaces.

Apart from excellent salaries, four weeks' holiday and company pension scheme, the company also offer a bonus scheme and relocation expenses.

Ref. N2/1101

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981

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16 Bedford Row
London WC1R 4EB
01-242 9356
Telex 21120

OCC

Specialists since 1971 in UK and international computer appointments

CONSULTANT ANALYSTS & PROGRAMMERS

to £8,000 + Benefits

AMERSHAM, LONDON and Home Counties

Our client, Square One Computer Services Ltd., is currently recruiting additional experienced Analysts and Programmers for a number of new projects throughout London and the South East.

The Consultancy Division requires staff to work with mainframe computers on the full range of commercial applications from small batch projects through to large on-line database systems. The work is carried out at client installations throughout London and the Home Counties, applicants must therefore be prepared to travel to different locations. Travelling expenses will be paid between home and the client site. Analysts should have a broad commercial background. Programming applicants should have experience in COBOL, PL1 or MK4 on mainframe equipment.

The Mini Applications Division requires Analysts and Programmers at all levels to work on minicomputer projects. This Division is based in Amersham and Chesham, Bucks, primarily using Hewlett Packard and Data General equipment. Good commercial experience on any mini machine using COBOL would be ideal.

To apply for these positions, or for an informal discussion, please ring Clive Wright on 01-242 9356 or write to the address above, quoting Ref. 491/CW. If it would be more convenient to telephone in the evening, or during the weekend, ring East Grinstead (0342) 22270

Square One will be holding an open evening in London later in January, to which all interested applicants are invited. Please watch this paper for further details or ring Clive Wright on the above number.

AUCKLAND NEW ZEALAND

APPLICATIONS ANALYSTS
PROGRAMMER ANALYSTS

IDAPS is an independent bureau specialising in insurance, finance and manufacturing distribution. Founded in 1970 as the data processing arm of the New Zealand Insurance Group it is now one of New Zealand's most respected data processing organisations. IDAPS attribute their success firstly to their people, secondly to their specialisation and thirdly to their policy of keeping in the forefront of information technology.

The equipment comprises an IBM 370/148 in Auckland and a 370/135 in Wellington. A communications network links the computers to 18 centres throughout New Zealand. Their main programming language is COBOL.

They require a number of applications analysts and programmer analysts for their Auckland centre. A background based on IBM equipment and methods is an essential requirement. Candidates will be ideally in the 23 to 35 age group and will wish to settle in New Zealand.

Your rewards, as may be expected from a successful people company, will be a fully competitive New Zealand salary (£6,000 to £8,000 per annum, reviewed after 8 months) plus excellent fringe benefits. These, plus financial assistance with relocation, will be detailed at your interview.

Prescot Computers specialise in recruitment for New Zealand and are assisting IDAPS in this assignment. Interviews by Prescot and/or a senior member of IDAPS will take place throughout January. We would prefer to interview you in your own locality if this can be arranged, and would therefore like a quick response from you. Please telephone Chad Stolper at 01-242 2142 or, if you prefer, write to him at:

Prescot Computers Limited
8 Bloomsbury Square
London WC1A 2LP

Telex 23110

Tel. 01-242 2142

ALBERTA - CANADA

SENIOR SOFTWARE SPECIALIST

Do you want the opportunity to apply and develop a wide range of skills and expertise? This rapidly changing and growing environment will provide excellent scope and challenge as illustrated by the variety of duties. Evaluation of new software, assistance in system and program assurance reviews, technical support to analysts and operations, and maintenance of existing software.

This is a senior position and candidates will be expected to have:

- A background in operating system installation and maintenance
- Communications network experience
- Working knowledge of an Assembler level language
- Cobol experience in a business environment
- A university degree in data processing or equivalent experience
- The ability to work independently and as a team member or leader in an environment which demands excellence in product and service

Our environment is an IBM 370/138 disk-orientated system with the accent toward terminal network development.

Preference will be given to candidates with knowledge and experience pertaining to DOS/VS, CICS/VS and VSAM.

Starting salary 20,400-26,000 dollars negotiable depending on qualifications and experience. It is combined with an excellent package of benefits including a generous relocation allowance and free medical and dental insurance plans.

We are an insurance-type organization with an annual income of over 150,000,000.00 dollars. We are Edmonton based in Alberta — a province with a rapidly expanding economy in the midst of a flourishing petro-chemical industry.

Applications, providing details of education, experience and expected salary, should be forwarded airmail, to: Director of Personnel, Workers Compensation Board, PO Box 2415, Edmonton, Alberta, Canada, T5J 2S5.

RSX - 11M

MACRO II, FORTRAN
£5.5-8K + Car

[illegible]

COBOL CROYDON

IBM OS-DOS
£5.5-7.5K p.a.

[illegible]

1900 - 2900 LANCASHIRE

COBOL PROGRAMMERS
£5,500-£6,500 p.a.

[illegible]

REAL - TIME

SYS. 3-32 + PDP-11
C. London £6-8K

[illegible]

MATRIX

360 Oxford Street
London W1N 9HA
01 491 4636

MYRIAD

SENIOR SYSTEMS ANALYSTS

N.W. LONDON — **TOTAL SALARY £7000-£8500**

These positions will be filled by experienced Analysts who are capable of managing a systems project team through all phases of development. Teams comprise up to twelve staff and the Senior Analysts will usually report to Project Leaders or a Systems Manager.

Being primarily responsible for in-depth investigations of user requests, the successful candidates will possess the ability to express themselves clearly and concisely at middle-management level.

With systems specifications accepted, the Senior Analyst will become responsible for defining major areas of the system and he/she will continuously assess project requirements for each phase of development. Progress is monitored regularly and specifications will be updated to meet changing needs and new technical innovations. Certain projects will involve multi-national applications so all senior personnel will become familiar with company standards and policies which are strictly adhered to.

The company is a very successful, international organisation operating modern IBM equipment to service a wide variety of users in the U.K. and Europe. Situated on the outskirts of London, commuting to the modern offices can be both pleasant and economical coupled with the added advantage of reasonably priced housing. Employee benefits are commensurate with other major organisations and include re-location expenses, an excellent staff restaurant and a very active sports and social club.

Ref. S2/1101

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981 24 HRS.

MINI PROGRAMMERS & ANALYSTS

C. London — **to £7000 plus Mortgage**

An international banking organisation in the West End are seeking Basic/Basic plus Programmers & Analysts with a minimum of 3 years' experience. The company uses Dec Mini's and is currently developing On-Line Systems, so any experience in this field will be an advantage. Salaries are high, prospects are good; and a 2½% Mortgage scheme is also available.

Reference HK2/1

FORTRAN PROGRAMMER

Middx. — **to £6000**

An international company based in Middlesex are seeking Fortran Programmers with a knowledge of graphics and a minimum of 18 months' experience. The company has a range of hardware which includes a large Mainframe & several mini & micro machines. Salaries will be very good with all large company benefits.

Reference HK2/2

REAL TIME PROGRAMMERS

West End — **£5000 to £6000**

One of the country's most respected Software Houses has a number of opportunities in their Real Time Systems Division based in Central London. Positions exist at all levels for Programmers & Analysts with a minimum of 12 months' experience upwards in ASSEMBLER or FORTRAN on any Real Time System. Salaries & Career prospects are exceptionally good with plenty of variety including travel overseas.

Reference HK2/3

OPERATIONS

ICL 1900 — **£5000**
Shift leader required for retailing organisation. 2 years' experience on GII or GII+. 2 shifts only. Good perks.

ICL 1900 — **£4600**
Large installation changing to 2960 requires Senior Operator. 2 years' GII experience. 2 shifts only.

IBM 370 OS — **£6000**
Senior Shift Leaders and Senior Operators required for large IBM user. Applicants must have JCL and Utilities knowledge. TP experience also useful.

IBM 370 OS — **£4000**
Financial Institution requires Operators with 6 mths'+ experience. 3 shift 5 days. Excellent career prospects.

IBM 370 DOS — **£4600**
Senior Operator with 2 years' experience required by East London site. Good prospects of promotion to shift leader in 6 months.

IBM 370 DOS — **£3600**
6 months' plus experience on any mainframe. 2 shift working with overtime some weekends. Excellent perks.

HONEYWELL GCOS — **£4800c**
Minimum of 16 months' experience required for exceptional site — 2 shifts only.

UNIVAC—90/40 — **£4500+**
1 year's experience needed for manufacturing company. Good perks and no nights.

UNIVAC-90/30 — **£4600**
Senior Operator with a minimum of 2 years' experience needed for fast developing site, only 2 shifts.

NCR B1 — **£4000**
Junior Operator required for major manufacturing company. 6 months' experience minimum.

PDP—DEC 10 — **£4800c**
2 years' experience, for a Senior Operator, required for South London site. Early evening finish.

DATA CONTROLLERS
URGENTLY REQUIRED, BOTH JUNIOR AND SENIOR, SALARIES UP TO £6000.

Computing Services Association

COBOL PROGRAMMERS

City — **to £5000 plus Mortgage**

A major financial organisation with an expanding ICL 2900 system is seeking several COBOL programmers. These positions will be ideal for people with 12 to 18 months' experience on any mainframe, and who want ANALYSIS prospects.
The company offers high starting salaries, Season Ticket Loans, Flextime and a Subsidised Mortgage.

Reference PG2/4

PL1 PROGRAMMERS

West End — **£5500 plus Mortgage**

Running a 370/135 installation, this company requires PL1 programmers with 12 months' experience and lots of initiative. The work is varied, and will provide excellent experience for the future.
The package is first class, including Flextime, Season Ticket Loans & a Subsidised Mortgage scheme.

Reference PG2/5

RPG II ANALYST/PROGRAMMERS

City — **to £8000 plus Mortgage**

RPG II people at all levels are needed for this financial company based in the City. The experience required varies from 18 months to 5 years, covering PROGRAMMERS, ANALYSTS, and PROJECT LEADERS.
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Reference PG2/6

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Sceptre House
169–173 Regent Street
London W1R 7FB

datascene

01-439 7871
24 hour answer phone

هكذا من الأصل

ANALYST/ PROGRAMMERS

MOORGATE £5,000 - £7,500

Our client is the major multi-national supplier of NETWORK SERVICES; because of the continuing growth within the UK, the central implementation group has additional staffing requirements at all levels. All positions offer:

★ PROJECT PARTICIPATION FROM DESIGN TO HANDOVER
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★ MODERN OFFICE FACILITIES

As they provide continuous training utilising modern educational facilities, re-inforced by extensive departmental experience, they are seeking Analyst/Programmers with 18 months' to 4 years' experience with high level languages on any hardware.

For further information please telephone **GEOFF MARSH on 01-499 4501.**

Ref: RW 2/1

SOFTWARE PROGRAMMERS

to £8,000 + Relocation

MICROS IN THE HOME COUNTIES

One of the world's major corporations have been involved in creating a new generation of high technology Voice and Data Communication Systems. The 1980's will see a radical change in our public and private telecommunications facilities.

To make this change happen generic software has been designed to control these multi-microprocessor based computer systems

Technically, you should be able to demonstrate a knowledge of block structured high-level language. Additional knowledge of low level languages, man-machine interfaces and real-time communications procedures would be particularly well received

Successful candidates will be secure in the knowledge of a high salary range and more senior people can now receive the rewards their experience deserves.

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Ref. RW 2/2

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ANALYSTS AND PROGRAMMERS

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A young dynamic Systems House with several U.K. offices, is looking to 1979 as its third successive year of growth.

Until now all of its systems have used Mini computer hardware, however, in keeping with its style they will be diversifying into new markets in 1979. This continued growth is thus your opportunity to move into the letest software and hardware technology.

Analysts who can demonstrete a commercial systems background on Minis, particularly PDP 11s, and Progremmers who possess a sound knowledge of BASIC are the technicel requirements. Equally important is the ability to work in a team environment to tight deedlines with some of the most professional people around.

Rapid career progression based on merit, will be to Technical Consultant or Project Management positions.

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Ref. RW 2/3

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One of the world's major manufacturers of Hardware Systems are seeking to augment their existing team of Software Engineers with both senior and junior programmers.

Working on the very latest Mini and Micro Hardware successful candidates can look forward to a rewarding career initially in one of these two areas:

★ Operating Systems ★

★ Data Communications ★

Both of these areas call for low level programming skills and individuals will be expected to demonstrate their ability in identifying problems and in proposing and executing their solution. Your future is secured with a manufacturer committed to staying at the forefront of technology.

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Ref. RW 2/4

hutchinson-scoggins recruitment
47/48 New Bond Street *(entrance in Maddox Street)* London W1Y OHE Telephone 01-499 4501

PERMANENT ESSEX

Systems Analysts — c £6.5

Our Client, currently developing Real-Time MIS systems, is looking for good Analysts to help enhance their current developments using e cluster of Univec kit. Should you wish to enlarge your experience with on-line Reet-Time experience, please do not hesitate to phone. 1C419

Senior Analysts — c. £7k

A large manufacturing and wholesale Company is seeking persons with sound analysis experience to develop and enhance the business. Backed by a large IBM configuration, these opportunities provide you with an excellent chance of furthering your career immediately. For further details phone now! 2C419

Analyst/Programmers — c. £6.5k

If you are seeking variety, a dynamic working environment, fast career progress and good technical training based on IBM mainframes this opportunity may be of interest to you. Our client runs a Real-Time network located in a rural setting, where living costs are well below the average for the S.E. No matter what your programming or analytical experience a 'phone call could change your whole lifestyle — for the bettert 4C419

Analyst/Programmers — c £5.5

If you ere good at RPG2, are familiar with any machine in the IBM System 3 range and you have a flair for commercial analysis and design then do not hesitate to contact us now! Located in a very pleasant country village our Client offers e good career path and excellent opportunities. 5C419

Assembler Programmer — c £6.5k

This is an excellent opportunity for an ex-Systems Programmer, or a very competent assembler programmer to help develop an On-Line Real-Time system. The kit is IBM mainframe and the application will involve production control suites and some process control. Our Client is a large manufacturer and offers numerous company benefits. Please phone now for details 6C419

Systems Programmer — c £7k

Our Client, e large multinational Company, operating an IBM 370 machine under OS-VS is looking for a really good 'practitioner'. If you ere keen to learn, eager to progress and have the ability to really make things 'tick' then do not hesitate, phone now for a quick assessment of your chances. 6C419

Analyst Programmers — c £6k

If you have at least two years' experience in either Cobol, Assembler or PL1 and you wish to progress rapidly into either Anelysis, Project Management or Software development then our Client would be very interested in talking to you now. Numerous large company benefits are offered with these interesting positions. 7C419

Programmers — c £4.5k

Our Client is currently running an ICL 1900 kit but is shortly to purchase powerful ICL 2900 series machines to increase business. So, if you have only 18 months' COBOL experience, preferably on ICL kit, and like working in excellent surroundings which will be supplemented by the usual perks one comes to expect from a leading Bank, then pick up the phone and find out more now! 9C419

Systems Designers — c £7k

If you cell yourself e 'designer of systems' or if you would like to be known as one, then here is an excellent opportunity to do so now! Our Client is looking for persons with good analytical and design capability preferably on IBM kit to help them get e new development phase off the ground. 9C419

If you can't see anything here that suits you, still get in touch with us — We have many additional well paid vacancies in Essex and the City.

Telephone — John McLean for an up-to-date list of current opportunities on —

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JUNIOR OPERATORS...

AN IBM INSTALLATION WITH AN OUTSTANDING FUTURE...

The most common criticisms made by Operations staff are the lack of formal training and standards, ability to diversify their talents into other operational areas and a general lack of interest shown by management in their overall career prospects.

Can an installation provide the answers?

YES. Our client can provide an environment geared to success and places the utmost importence on developing the career prospects of their operationel staff.

SIX MONTHS IBM/OS (any OS System) OPERATING EXPERIENCE IS THE QUALIFICATION NECESSARY FOR THESE VACANCIES.

Applications era besed on 2 x IBM 370/148's with current opereting systams under the control of OS/VS1 and VM 370. Extansive communicetions equipment includes local and remote VDU's, typewriter terminals, and RJE facilities spread throughout the U.K. It is e highly sophisticated operetion and one that will repidly improve in terms of hardware and operational technology. The dapartmant also offers opportunities to move into Production Support, Network Control and Commerciel/Technical programming.

Starting selaries will ba in the range £3500-£4300 plus shift allowence end currently a TWO SHIFT system is in operation. Other benefits includa 4 week's holiday, Sports and Social Club, Steff resteurent and Shift dining facilities and an outstanding RELOCATION PACKAGE. The locetion is Dartford, Kent.

Contact Ref. MT 384.

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KENT HOUSE, 87 REGENT STREET, LONDON W1R 7HF.
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★ GOOD BASIC SALARY
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★ CAR SUPPLIED ON QUOTA

We require three consultants to join our already successful team of seven people. We plan to move to the West End in this the first quarter of 1979, and at the same time we will open new offices in Manchester and Birmingham.

These three London-based positions will be of interest to people already connected with DP Sales or Recruitment Consultancy, who can prove an effective and above average track record in their current career.

Candidates should be aged 23 to 34.

CONTACT JACK COWDY OR BOBBIE McCORMICK on 01-603 7335

IDP
Information Processing People
58 Pembroke Road, London W8. Telephone: 01-603 7335/6. Telex: 261298.
Computer Services & Recruitment Consultants.

SYSTEM /34 + HOLLAND

INTERESTED IN THE CHALLENGING DEVELOPMENT OF A USER-ORIENTATED ON-LINE SYSTEM /34 IN A VERY SCENIC PART OF HOLLAND?

READ ON:

We are an international trading company with complex and diverse interests whose administrative unit is situated in e plaasant wooded part of Holland.

Currently using an IBM System/34 we are engrossed developing an extremely complex data base type eystem to encompass all our activities including shipping, finance, administration, accounting, marketing, etc.

In order to maintain our development we are looking for a Programmer/Analyst who is an RPG II specialist with IBM System 32/34 experience. The job requires a self-starter with good initiative and an inventive mind, who can maintain existing programs and actively develop new sub-systems with the minimum of supervision.

Commensurate with the position a good salary plus attractive fringe benefits are offered to the right applicant.

INTERESTED?

Please write in complete confidence, giving full details of age, salary and career to date, to:

MIKE KEEN—EDP MANAGER
TRANSWORLD OIL B.V.
MEERWIJKSELAAN 11
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HOLLAND

Computer Services Manager

Cheltenham Spa from £7,000

Endsleigh Insurences, market leaders in the academic and professional sector, are embarking on a full in-house computerisation programme after 4 years with a service bureau.

To help us meke the transition es smoothly as possible, wo're looking for en enalyst/progremmer with a proven record of writing complex progrems in RPG11 in a GSD anvironmant who, after initial liasion with our softwere consultants in developing systems for our on-line IBM Syatem 34, will assuma full rasponsibillty for the setting up and running of our computar aervices department. The successful candideta will be well experienced in Project Work preferably as team leader and will play a vitel role in our middle manegement structure.

We're e young company who pride ourselves on our progressive attitudes not only to our business but to our staff as well. Benefits include a selary sufficiently negotiable to be no bar to excellently qualified candidetes, non-contributory pension, free life essurance, PHI, and relocetion expensee where relevant.

And being e thoughtful company, we located our head-office in handsome, regancy Cheltanhem Spa which, with the Cotswold on the door-step is one of the ideel places to live, work end bring up a family.

Write, giving details of career to date to our Personnel Manager Danny Mullen.

Endsleigh

Endsleigh Insurances (Brokers) Ltd.,
Endsleigh House, Cheltenham Spa,
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PROGS AND SENIOR PROGS

ICL Equipment — Cobol
KENT/SE LONDON area
£4500 to £6000

Our client provides professional share registration and membership services using advanced computer systems including a video terminal network. Due to further development work, more Programmers and Senior Programmers are urgently required to join their young, enthusiastic DP Department.

Applicants should have at least one year's experience using Cobol on commercial applications and preferably ICL equipment.

Excellent company benefits are offered including a minimum 4 weeks' holiday, free life assurance, and paid overtime. Relocation facilities are also available where appropriate.

Reference PJ 78611

SYSTEMS ANALYSTS

ESSEX **c £7000**

Our client is a member of a multi-national group and need competent Systems Analysts to join their expanding DP Department. These positions offer the opportunity to increase knowledge of on-line communications, database and a wide range of applications from financial to technical.

Applications are invited from Systems Analysts with two years' experience who have implemanted at least one system.

Excellent company benefits are offered including comprehansive relocation expenses and paid overtime facilities.

Reference PJ 78612

DOS/VS SENIOR OPERATOR

CROYDON **£3762**

A senior Operator is required for a large company in the Croydon area using an IBM Meintrame working under DOS/VS POWER/VS. Two years' DOS/VS experience would be ideal although people with less experience may be considered.

There are also excellent opportunities in due course for promotion to junior operetions management or programming.

Reference PJ 78608

COBOL PROGRAMMER

NORTH LONDON **£5,500**

Our client is a major food manufacturer and is currently offering an opportunity for a Cobol Programmer to join a small and friendly team working on various commercial applications with a view to moving into analysis.

Two years' experience of Cobol is required and e knowledge of tele-processing and Assembler would be an advantage although training will be given where necessary.

Excellent company benefits are offered including staff discounts and four weeks' holiday per annum.

Reference PJ 78610

Further information and an application form contact the number below

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computer services
145 WARDOUR STREET LONDON W1V 3TB

TEL 01-439 3671

SENIOR SYSTEMS ANALYST

City of London

ORION

THE ORION BANK is a leading international investment bank, with six of the world's major banks as shareholders. Orion's assets exceed £1 billion and the profitability has increased impressively since its inception in 1970. Orion employs 280 staff in a modern, air conditioned building and is successfully involved in arranging financial packages through the Eurobond and syndicated loan market for an impressive list of corporate and private clients throughout the world.

ORION

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ALL POSITIONS REQUIRE you to be presentable, hardworking, with a good standard of education and capable of fitting into a small but expanding department. Skills will include the vision to define original but practical systems, the ability to discuss business problems logically and intelligently with users and to work well in pressure situations. Further you must be self motivating, ready and able to accept responsibility and keen to advance your career.

Senior Systems Analyst

Package C. £10,000

Reporting directly to the Systems Manager the Senior Analyst will lead a team of Analysts and Programmers and be responsible for the development of one of the scheduled systems using on-line and database techniques. Proven experience is required within the money market/foreign exchange environment and all project activities from feasibility study to implementation.

Systems Analysts

Package C. £9,000

A Systems Analyst will report to a Senior Analyst and will be responsible for the analysis and detailed design of one of the four advanced systems scheduled for early development. All systems will utilise on-line and database techniques. Previous experience will include at least 2 years as an Analyst with systems design experience and a minimum of eighteen months programming experience. Ideally experience will include involvement in an on-line/real-time environment whilst applications knowledge gained in a merchant or investment bank would be preferable, but not essential.

Junior Analysts

Package C.

Applicants will require a solid background in programming together with at least 1 year's systems experience gained in a well organised department. Qualities will be those mentioned above, coupled with the desire and the ability to progress quickly towards a full Systems Analyst role.

Capp Associates have been retained to recruit male or female applicants for these positions; for further details please telephone or write to our CROYDON office, quoting ref: CWIO5-9T or complete and return the coupon.

ORION

Please send me further details and an application form.

NAME

ADDRESS

HOME TELEPHONE NO.

BUSINESS TELEPHONE NUMBER (USED DISCREETLY)

REQUIRED POSITION

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CAPP ASSOCIATES
LONDON AND MANCHESTER

Computing Services Association

01-686 9693 (24 HOUR ANSAPHONE)
19, PARK STREET, CROYDON, CR9 1TN

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PROGRAMMER

to support IDMS on ICL 2960s

The installation includes 2 ICL 2960s running under VME/B, supporting TP, MAC, distributed processing and IDMS database.

We now seek someone with experience of database implementation (not necessarily under IDMS) to join the Technical Support team. He/she will assist us in supporting IDMS users on BBC computers, by consultancy, project participation and training, implementing, testing and maintenance of database software and development of new facilities.

The Technical Support Unit is located at the BBC Computer Centre in West London.

The salary will be in the range £5,200-£6,850 (currently under review).

Please apply for an application form enclosing addressed envelope and quoting reference number 1868/CW to Appointments Department, BBC, London W1 1AA, telephone number 01-580 4468 Ext. 4819.

BBC

ANALYSTS/ PROGRAMMERS

Consequent upon an expansion in our Systems and Computer Department we now have vacancies for experienced SYSTEMS ANALYSTS AND PROGRAMMERS.

We provide a range of support and advisory services to Group Companies using an ICL 1901-T machine. The main language in use is COBOL and we operate under a George II system.

Programmer

Applicants will be at least 'A' level standard and have 2-3 years' programming experience. A knowledge of COBOL will be an advantage as will experience of ICL machines, George II operating system and communications systems generally.

Systems Analyst

Applicants will have between 2 and 5 years' experience in systems design coupled with experience in another discipline such as accounting or production control. The ability to programme in COBOL will be an advantage as will a knowledge of communications systems in an ICL context. The requirements are such that it is unlikely anyone under 28 will have sufficient experience.

The successful candidates (male/female) will find the work challenging with demands being made upon both motivation and judgement.

The conditions of work are good and flexible working hours are in operation. If you live some distance from Coventry it may be possible to arrange interviews near your base.

Please write, under confidential cover, quoting sufficient detail of age, experience, qualifications and salary to render unnecessary the initial completion of an Application Form.

The Personal Executive
Wickman Machine Tool Manufacturing Co. Ltd.
Banner Lane, Tile Hill, Coventry CV4 9GE

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to join a small Telecommunications team maintaining an on-line system using over 450 terminals throughout the United Kingdom. This rapidly expanding system is linked to a Univac 1110 mainframe via an extensive network of P.O. lines, Racal-Milgo modems and TDM's.

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High Holborn
London WC1V 6PW
Telephone 01-242 5842
Ext. 253

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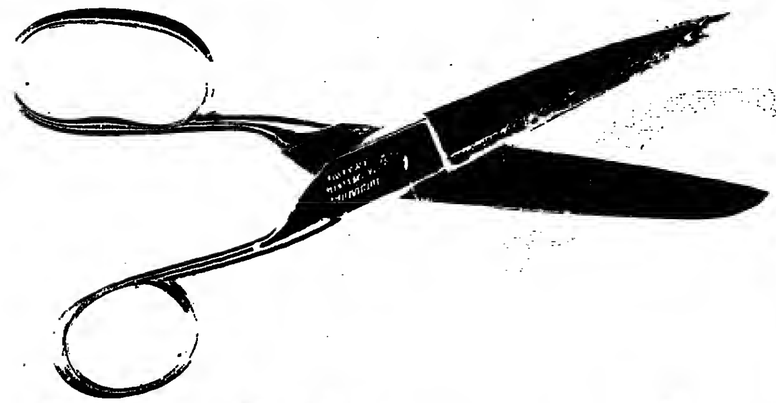

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Not satisfied with the phenomenal success of their latest products, our Client has set up a WHOLE NEW DEPARTMENT to capitalise on that success, with YET MORE EXCITING DEVELOPMENTS in HARDWARE & SOFTWARE. This department needs a FURTHER 12 PEOPLE IMMEDIATELY.

System Programmers & Microcoders **(Berks)** **Circa 5-8K**

Programmers with 2 years + experience of ASSEMBLER LEVEL languages and/or Operating System Development who wish to rapidly expand their experience of Systems Software; or Engineers wishing to branch into Systems Software.
For further details of these exciting opportunities
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Freepost, Blackfriars House, The Parsonage, Manchester M3 2JA

LONDON 01-935 0671
Freepost 13, 3 Mandeville Place,
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Alternatively write to H. E. Batchelder, Marconi Avionics Limited, Elstree Way, Borehamwood, Herts. Please quote reference MA79006

MARCONI AVIONICS

Business Systems Manager

East Midlands Based
c. £8500+car

Our client, a major British group in printing, packaging and publishing, has embarked on a long-term plan to investigate, develop and implement new manual and computer systems for all users in the organisation. Computer systems will be developed for the central mainframe or distributed equipment as appropriate.

The successful candidate will be responsible for the investigation of business requirements and the subsequent specification and implementation of commercial and financial systems, in conjunction with the Computer Services Manager where computer solutions are appropriate. The Business Systems Manager, who will report directly to the Group Finance Director, will control a small multi-disciplined team of Business Systems Analysts.

Our client invites applications from systems professionals with around 8 years experience in systems development, project scheduling and control at a supervisory level. The person likely to meet the requirements will be more interested in getting involved in the practical solution of business management problems than in the technical aspects of DP.

An excellent starting salary around £8500 will be offered to the successful candidate, together with a company car and significant benefits package. Relocation expenses will be available as appropriate.

Please 'phone for Personal History form, or write enclosing CV to Tony Palframan, quoting reference number N58. Applications are invited from either sex.

BIS Applied Systems Limited
Quay House, Quay Street
Manchester M3 3JH
Telephone 061-831 7031

BIS Applied Systems

Contract Requirements

ICL 2900 VME/B COBOL
Vacancies in UK/EUROPE
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Software Division
Knight
Staff Services Division of BOC Datasolve and a member of Computer Services Association

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UNIVERSITY OF HONG KONG

CHAIR OF COMPUTER SCIENCE

Applications are invited from suitably qualified candidates for the Chair of Computer Science which is expected to be established from 1 September 1979. Annual salary (superannuable) will be within the professorial range and not less than HK$140,820 (£1 = HK$9.30 approx). Further particulars and application forms may be obtained from the Secretary General, Association of Commonwealth Universities (Appts), 36 Gordon Square, London WC1H 0PF, or the Assistant Secretary (Recruitment), University of Hong Kong, Hong Kong. Closing date for applications is 31 January, 1979.

Systems Analysts
Peterborough
Total Remuneration up to £7,200

British Sugar is an expanding Company. Already 'Silver Spoon' sugar is the leading retail brand in the United Kingdom. With a current turnover of more than £300M and an expansion programme of £150M the Company is moving towards supplying half the country's needs for sugar.

To meet these changing requirements of the business and in order to utilise new technological advances we need to strengthen the Computer Services Department. This Department provides a central computing function to seventeen sites across the country. We now use VDU systems which are being expanded to cover all locations.

Our requirement is for Analysts with practical experience in system design and implementation. We are looking for people who have worked with user departments in order to define their requirements and we expect a good educational background.

We pay competitive salaries and believe that we can provide a progressive and challenging environment in which to work.

If you think you meet our requirements please write, enclosing a full CV, to:– R. J. Bass, Personnel Services & Staff Development Manager, British Sugar Corporation Ltd., P.O. Box 26, Oundle Road, Peterborough.

British Sugar

Institute of Naval Medicine, Alverstoke

Computer Scientist

Royal Navy personnel, particularly those in ships and submarines are sometimes exposed to unusual health hazards. To help minimise these, the Institute at Alverstoke in Hampshire carries out research into all relevant areas of medicine. The computer scientist supports personnel involved in these research areas.

The computer scientist appointed will be responsible to the statistician for operating and developing the use of the terminal link to an ICL 1904S computer at AUWE, Portland, the Wang System 2200B and the Data General Eclipse System. It will be essential to develop and acquire both software and hardware for processing batch and on-line data from medical trials and surveys. The successful candidate will provide programming support to scientists in the fields of medicine, physiology, psychology, occupational hygiene and biochemistry particularly during experimental trials and will, as necessary, participate as a member of any working group. Additionally, the computer scientist will maintain and establish new contacts with computer users in other Government Departments.

Candidates, normally aged under 30, must have a good honours degree or equivalent in computer science or closely related subject. A good working knowledge of FORTRAN together with 2 years' programming experience is highly desirable. An interest in mathematics or statistics is also advantageous.

Appointment as Higher Scientific Officer (£4100–£5450) or Scientific Officer (£2840–£4410) according to qualifications and experience. Promotion prospects. Non-contributory pension scheme.

For further details and an application form (to be returned by 6 February 1979) write to Ministry of Defence, CM(S) 1b3, Room 310, Savoy Hill House, Strand, London, WC2R 0BX. *Please quote ref: SA/6/RG.*

Department of Industry,
Laboratory of the Government Chemist, London

Computer Programmer

The Laboratory provides an independent service of chemical analysis and advice for all government departments. It also carries out research in analytical chemistry, where the development of methods of analysis is of public importance. The Laboratory, now in Central London, will be dispersed to Cockermouth, Cumbria in the mid 1980's.

The Laboratory uses several dedicated computers and the Computer Programmer appointed will work on a 16 bit word machine with a 65K Store and 200 Mbyte disc storage, to which a considerable range of Laboratory equipment is connected. Data acquisition, time sharing for 20 users, and batch stream services are provided.

Candidates, normally aged under 27, should have a Degree/HND/HNC or equivalent in an appropriate scientific discipline. A minimum of 18 months' programming experience in a high level language, preferably FORTRAN, is essential.

Appointment as Scientific Officer (£3390–£4880) with starting salary according to age, qualifications and experience. Promotion prospects. Non-contributory pension scheme.

For further details and an application form (to be returned by 6th February 1979) write to Laboratory of the Government Chemist, Cornwall House, Stamford Street, London SE1 9NQ. *Please quote ref: SA/6/MB.*

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Apart from managing the construction of the City of Yanbu, we also have long-term responsibility for community planning, developing the Municipal organisational structure, and for the training of Saudi Nationals to fill posts in the completed project. A large part of these responsibilities rests on the planning, implementation and operation of the City's computerised systems.

We need pioneers in Systems Analysis to plan and influence the growth of this system from Hewlett Packard minicomputers through to massive Mainframe configurations; to create a highly-sophisticated Management Information System for the construction of the project and, ultimately, similar systems covering transport, amenities, payroll, finance and utilities within the City. We're looking for articulate and technically-competent professionals able to convey ideas in lay terms, who have front-end experience, preferably overseas.

Analysts and Planners with these capabilities, able to start from nothing and evolve an integrated system know what they're worth. But so do we!

If you'd like to know more about this challenging project and to have the opportunity of discussing just what we can offer you in return for your abilities, write or telephone Saudi Arabian Parsons Limited, c/o John Hooley, The Ralph M Parsons Company Ltd., Radley House, 39 South Ealing Road, London W5. Telephone: 01-579 3131.

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2 Duties will include full responsibility for systems programming on a 192K, IBM 370/115(2) using DOS/VS and VANO/LI. Future expansion will include teleprocessing.

A good working knowledge of COBOL and Assembler is essential along with experience of POWER/VS and VANO/LI or O/LI.

Closing date Monday 15 January 1979.

Application Forms and further particulars may be obtained from the Personnel Department, Regional Headquarters, Newtown St. Boswells TD6 0SA.

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Zimmer Orthopaedic Ltd. are market leaders in the manufacture of Fracture Equipment, Wheelchairs and Rehabilitation Equipment. They have two excellent opportunities in their Data Processing Department where you will be an integral part of their professional management team.

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Ideally aged 27-45 years with good practical experience in commercial systems and with a PDP 11/40 computer. Knowledge of the RSTS/E operating system and programming language Basic + is required.

Analyst Programmer — c £5000

Directly responsible to the Data Processing Manager with whom close liaison is kept on the running of the department of 9 staff and taking over in his absence. Duties include the programming of the Digital PDP 11/40 computer using language Basic +.

Ideally aged 25-45 years with experience in the use of a PDP 11/40 and commercial systems. Knowledge of the RSTS operating system is essential with knowledge of language Basic + being an asset.

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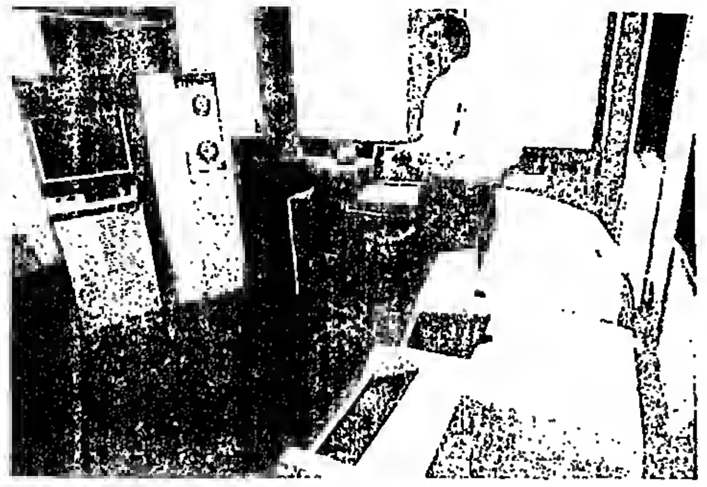

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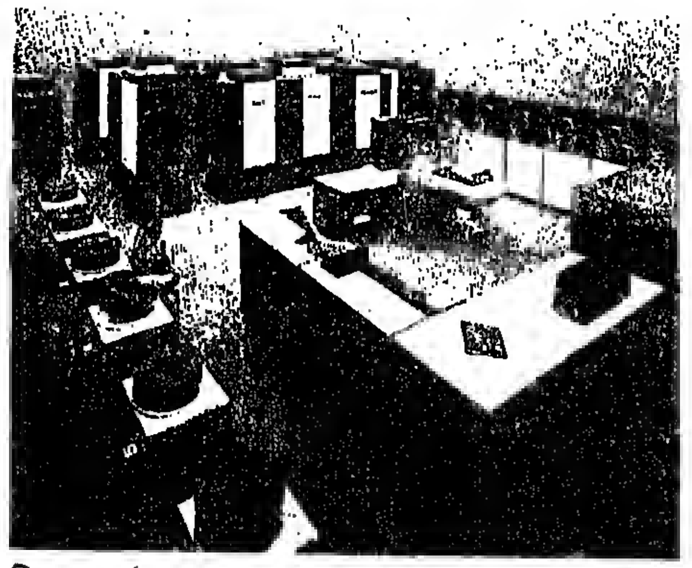

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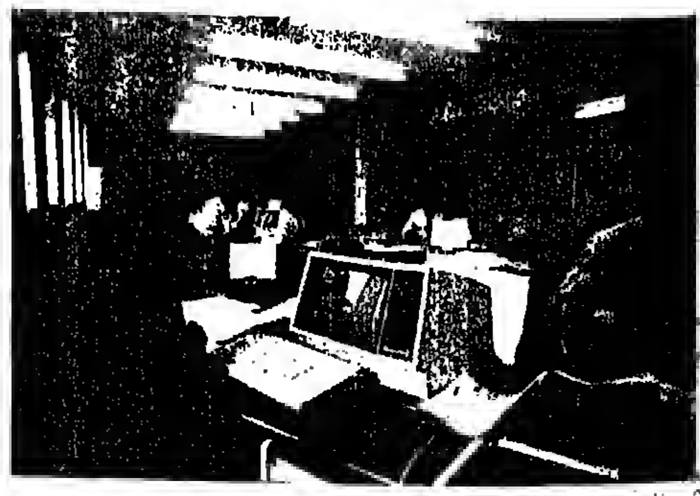

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PROGRAMMERS — MIDDLESEX. TO £6,500

Candidates should be experienced on ICL 2900 or 1900 series equipment using Cobol and either VME/B or George II+. Applications include development of a Mileage Cost Reimbursement System, Incentive Bonus Scheme Admin System, Salesmens Commission System, Pensions and Payrolls and an Employee Database. Additional enhancements include Cost Accounting, Creditors Payments System and a Payroll System. Relocation assistance will be given where appropriate.
Consultant — Don Philp

PROGRAMMER — LONDON, SW1. TO £5,200 & LONDON ALLOWANCE

We require an experienced programmer to work in a small group providing computer services to a variety of user departments programming econometric models to market research data. The company use IBM 370 and ICL 1900 series facilities via GEC 4070 Timesharing terminals and prefer 2 years experience in Fortran and Cobol. Fortran experience will be essential. Candidates should also have knowledge of ICL Assembler and George III, although training will be given in these areas to otherwise appropriate candidates. A degree will be preferable in a related subject such as Maths, Stats, Computer Science etc.
Consultant — Don Philp

CUSTOMER APPLICATIONS ENGINEER — MANCHESTER. NEG.

We seek an Engineering Graduate with some Computer Aided Design experience. He will be responsible for assisting a Bureau/Timesharing service to apply their Computer Aided Engineering Design packages to provide full required client information facilities, enhancing the system where necessary. It would be useful to have some experience in the use of Finite Element Techniques.

Consultant — John Wood.

OPS MANAGER, PROGRAMMERS TO ANALYSTS — GLASGOW. FROM £4,500 UPWARDS TO £7,000

A large engineering group using IBM hardware under OS have an urgent requirement for a wide range of additional staff at all levels of a rapidly expanding organisation. Languages include Cobol and Assembler. Any knowledge of CICS, DL/1 and PROJACS would be especially welcome. Significant employment prospects exist for a large and varied number of DP people up to Project Leader levels. Please apply urgently to EMS today completing the attached application form.
Consultant — Don Philp

IBM PROGRAMMERS — SURREY. TO £6,700

Experienced IBM Programmers, with at least 2 years Cobol and CICS involvement are urgently required to work on Commercial and Stock Control projects. Any VTAM experience would be especially advantageous but adequate opportunities exist to gain solid future experience. Relocation assistance will be given where appropriate.
Consultant — Selina Mills. Telephone 0782 623665

ANALYST/PROGRAMMER — REDDITCH, WORCS. NEG.

Our clients are developing MIS around a Univac (Varian) 77 mini with discs, tapes and several VDUs. Programming will be in Cobol. Currently the company runs a mixed on line and batch service based on ICL 2903. Candidates should be educated to 'A' level standard, be aged 24-32 with a minimum 3 years' solid DP experience and be good communicators. Any previous mini Cobol experience would be especially welcome. Some knowledge of On line transaction processing or even database would be attractive also. Applicants must have sound commercial experience. Relocation support will be provided where necessary.
Consultant — Carol Proudman. Telephone 0782 623665

ANALYSTS AND PROGRAMMERS — SLOUGH. NEG.

Analysts with a good commercial background are urgently required to assist a large Turnkey group on both feasibility studies and client systems development. Any previous mini experience would be especially advantageous. Programmers must have good Assembler experience and will initially be working on Cobol compiler development. Any previous mini experience will be of considerable interest.
Consultant — Brian Davies. Telephone 021-454 7906.

هكذا من الأصل

PROJECT LEADER — LONDON, EC1. TO £8,000

Our clients, an IBM user, are seeking a senior analyst with a programming background, to assist with the development of Accounting and Stock Systems. Preference will be for candidates with Mark IV language knowledge, but COBOL would be an acceptable alternative. Good user communication ability will be important.
Consultant — John Wood. Telephone 0782 623665

PDP PROGRAMMERS — SURREY. NEG.

A major electronics manufacturer has urgent needs for experienced DEC Programmers to work on radar systems for industrial and defence projects. Experience sought includes RSX-11 or RT-11 with preferably MACRO-11 also. All candidates must have used PDP 11 equipment in a technical or scientific environment.
Consultant — Brian Davies. Telephone 021-454 7906

PDP 11 SOFTWARE ENGINEER — DORSET

Software Engineers and Analyst/Programmers are required by a large national electronics group to work at their Dorset factory on Traffic Control Systems. All candidates must have PDP 11 experience using CORAL or Assembler. Ideally some message switching experience will also have been gained.
Consultant — Brian Davies. Telephone 021 454 7906.

DOS OPERATORS — LONDON, SW9. TO £4,500

Experienced IBM-DOS operators are required by an industrial client working a 3 shift system. Shift times are 8.00 a.m. to 4.00 p.m., 3.30 p.m. to 10.30 p.m. and 10.30 p.m. to 8.00 a.m. Please complete the attached application form today for early interviews.
Consultant — Carol Proudman

ANALYST PROGRAMMERS — DERBY. NEG.

Our clients, an engineering group using an Allied Business Multibus Computer, require experienced Cobol Programmers, preferably with some mini experience. A significant quantity of applications development currently exists ensuring adequate job interest for years to come.
Consultant — Don Philp. Telephone 021-454 7906.

ANALYSTS — WILTSHIRE. TO £6,500

A major commercial trading group with a significant Data Processing mainframe investment have continuous requirements for experienced Analysts to work on Commercial and Distribution based systems. The company is based in an attractive part of Wiltshire with easy access throughout the West Country. Sound career prospects exist for all successful candidates with a successful major national group.
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COBOL PROGRAMMERS — NORTHUMBRIA. TO £5,500

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Engineers or current HNC/Graduates are required to work on PDP Real-Time systems in a design and programming capacity. Operating systems used at present are RT-11 and RSX-11. Languages include Macro-11, CORAL and Fortran. A variety of interesting projects are available in areas such as Entertainments Industries, Food Industries, Automatic Test Equipment, Process Control and Communications. Relocation assistance will be provided where appropriate. Attractive salaries are available for all levels of staff.
Consultant — Don Walklate. Telephone 0782 623665.

ANALYSTS/PROJECT LEADERS — LIVERPOOL. TO £7,000

An engineering group have urgent requirements for experienced IBM Analysts preferably with knowledge of either Total, DBMS or On-line systems. Systems currently being developed and enhanced include Manufacturing Information, Requirements Planning, Shop Floor Control, Physical and Financial Control of Sales, Installation and Maintenance operations, Statistical and Financial Systems. Ability to control a small team of analysts engaged upon several projects will be essential for project leaders in addition to being a direct personal contribution.
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RPG II PROGRAMMER — TO £6,000, WEST END, LONDON, W1

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Consultant — John Wood

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EMS urgently need over twenty more staff to support the Turnkey Systems Division. Staff are working on a wide range of development projects for both first time and network users. Ability to programme in Cobol and work as a small team member, committed to tight deadlines, will be important.
In house machines include Honeywell Level 6's and ICL 2904's. Experience of Cobol on any machine will be acceptable as re-training will be given. Applications include Ledger, Stock Control, Financial Planning, Payroll etc. Modular programming is currently used in an on-line environment. All programmers have immediate terminal access for development and testing. Occasional travel to client sites for testing and installation will be involved. Overtime working to help with tight deadlines will be essential. All Analysts must have had previous programming experience and be prepared to assist on frequent occasions whenever peak programmer loading occurs. Analysts will also be given Business Analyst opportunities to undertake feasibility studies and make client presentations assisting the Marketing teams. The installation is ultra modern and attractively furnished. Excellent career opportunities are available for all levels of motivated staff, keen to make a personal contribution to our outstanding growth record.
Either attend our interviews directly as advertised, or return your career form today and telephone us for an early meeting. Don't miss this outstanding opportunity of working on 1980's applications now.
Contact: Don Philip / Damien Hondslip

HONEYWELL ANALYSTS AND PROGRAMMERS — ENTIRE UK £4,000 to £8,500

EMS as the foremost Honeywell support consultancy within the UK, have a substantial quantity of requirements from most Honeywell users throughout the UK for Analysts and Programmers to assist with new developments.
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EMS is planning substantial further development of both our Consultants and Turnkey Systems Division during the coming months. Our Consultancy activities extend across all mainframe ranges and encompasses a wide range of industrial / commercial organisations. Applicants must, therefore, present a high level of Business Analysis capable of rapidly assessing clients requirements and proposing consulting solutions where appropriate or quantifying the relevant consulting experience required in either systems or programming and providing the necessary staff from EMS resources. A vast potential market exists for salesmen marketing resource support.
Equally, our Turnkey Systems Division provides total UK coverage, marketing Honeywell Level 6 mini-computer systems and supporting software to a wide range of UK users.
Experienced Salesmen capable of developing their own territories are urgently required. A substantial quantity of leads are also supplied by extensive and vigorous advertising campaigns and Road Show ventures. Salesmen must possess an adequate mini-computer knowledge for Turnkey Systems positions. Car will be provided with adequate base salaries and high prospective incentives. Apply by telephone for interview during the next week at our Birmingham Data Centre. All UK territories will be controlled from the pending regional development of other Centres.
Consultant John Wood

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Staff are urgently required to support growing client consulting commitments throughout the region and to work on a wide variety of development and maintenance projects. Applications include Ledgers, Stock Control, Distribution Systems, Financial Planning through to Payroll. Candidates should possess a minimum 3 years systems experience and be capable of working in a team environment both within very large and small installations. Opportunities exist to gain experience of major merchandising systems and futuristic hardware. So, with at least 3 years' systems experience, if you are interested in earning an attractive salary and expenses package, complete the attached career form today and return it to EMS without delay.
Consultant: John Wood (Newcastle Office)

COBOL, ASSEMBLER PROGRAMMERS — LONDON, MIDLANDS, NORTH 4K to 6K

We urgently require a minimum of 2,000 experienced Programmers to help fill current client requirements throughout every major town and city within the UK. Clients include Banks, Bureaux, Computer Manufacturers, Consultancies, Distributors, Engineers, etc. All Programmers, irrespective of background, currently interested in a lucrative new career opportunity should apply urgently to EMS via the attached application form for interviews in the areas of their choice by every local employer able to offer the job interest and salary required. Hardware includes IBM, Honeywell, ICL, NCR through to minis. Let EMS develop your career for you. Join thousands of other satisfied candidates.

Consultants — Carol Proudman, Selina Mills, Don Philip

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Britain's first IBM Series 30 site has a large number of outstanding vacancies on numerous interesting new development projects. Experienced IBM Programmers are urgently sought to work on large project teams. Any IMS, TSO experience would be especially valuable. Otherwise, general OS/COBOL will be acceptable. Relocation assistance provided.

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Position Required — Required Salary Range
Present Position — Salary

WHERE DO YOU WISH TO WORK

Within U.K. Yes/No	Acceptable Areas	Abroad Yes/No
Will you move Yes/No		Europe Yes/No
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NUMBER OF YEARS EXPERIENCE

Operating	Programming	Systems Design	Systems Analysis	Management	Total

Available for Interviews
Available for Employment

DETAILS OF SECONDARY AND FURTHER EDUCATION

Schools	Date	Examinations Passed
College/University	Date	Examinations Passed

Business Courses with Dates

1. Present Employer — Town
Position — Date Joined

TYPE OF INSTALLATION: Commercial / Manufacturing / Bureau / Banking / Insurance / Education / Scientific / Engineering

HARDWARE	OPERATING SYSTEM	LANGUAGES

Software or Packages

On-Line / R.J.E. / Real Time / Tele Processing / Time Sharing / Data Base

APPLICATION AREAS YOU HAVE BEEN INVOLVED IN (Please Tick)

Cost Accounting, Budgeting, Forecasting, Corporate Planning, Sales Ledger, Purchase Ledger, General Ledger, Credit Control, Order Processing, Marketing, Distribution, Traffic Analysis, Manpower Planning, Stock Control, Production Control, Petrochemicals, Linear Programming, Simulation, Personnel, Payroll, O.R., Radar, Statistics

Projects Completed — Responsibilities

2. Previous Employer — Town
Position — Date Joined

TYPE OF INSTALLATION: Commercial / Manufacturing / Bureau / Banking / Insurance / Education / Scientific / Engineering

HARDWARE	OPERATING SYSTEM	LANGUAGES

Software or Packages

On-Line / R.J.E. / Real Time / Tele Processing / Time Sharing / Data Base

APPLICATION AREAS YOU HAVE BEEN INVOLVED IN

Cost Accounting, Budgeting, Forecasting, Corporate Planning, Sales Ledger, Purchase Ledger, General Ledger, Credit Control, Order Processing, Marketing, Distribution, Traffic Analysis, Manpower Planning, Stock Control, Production Control, Petrochemicals, Linear Programming, Simulation, Personnel, Payroll, O.R., Radar, Statistics

Projects Completed — Responsibilities

Reason for Seeking Change
Details of type of position wanted
Additional Information — Please explain below, in an 8-10 line precis, your current duties and applications experience

FOREIGN LANGUAGES

Spoken	Written	Read

Please show the number of years experience of the following. Where your experience is not specified please use the blank spaces.

HARDWARE	OPERATING SYSTEM	LANGUAGES	PACKAGES/SOFTWARE
IBM 360/370	DOS	COBOL	FILETAB
ICL 1900	OS	FORTRAN	DRIVER
ICL 2960/2970	MVT/MFT	ASSEMBLER	CICS
ICL 2903	GEORGE 1	PLAN	IMS
UNIVAC 1100	GEORGE 2	PL1	BOMP
UNIVAC other	GEORGE 3	RPG 2	D BOMP
BURROUGHS 700/800	MCP	USERCODE	PERT
BURROUGHS other	Exec 8	AUTOCODE	VSAM
HONEYWELL 66	GCOS	EASYCODER	IDS/TDS
HONEYWELL 6000	OS 2000/200	ALGOL	MICROFILMING
HONEYWELL other	VMEB/VMEK	NEAT	TELEPROCESSING
NCR	J Level	CORAL	DMS
ICL System 4		DL1	
PDP			

3. Past Employer — Town
Position — Date Joined

TYPE OF INSTALLATION: Commercial / Manufacturing / Bureau / Banking / Insurance / Education / Scientific / Engineering

HARDWARE	OPERATING SYSTEM	LANGUAGES

Software or Packages

On Line / R.J.E. / Real Time / Tele Processing / Time Sharing / Data Base

APPLICATION AREAS YOU HAVE BEEN INVOLVED IN

Cost Accounting, Budgeting, Forecasting, Corporate Planning, Sales Ledger, Purchase Ledger, General Ledger, Credit Control, Order Processing, Marketing, Distribution, Traffic Analysis, Manpower Planning, Stock Control, Production Control, Petrochemicals, Linear Programming, Simulation, Personnel, Payroll, O.R., Radar, Statistics

Projects Completed — Responsibilities

PLEASE CHECK THAT EACH SECTION HAS BEEN TICKED APPROPRIATELY-

ADDITIONAL INFORMATION

General
Data Processing
Terminals
Software / Packages
Application Areas
Projects and Responsibilities

هكذا من الأصل

Analysts and Programmers

See America with Informatics
Above Average Salaries to $25,000.00
Plus Bonus at Completion of Assignment

Informatics Offers

- Openings at all levels
- An opportunity to move up into the management of this world-wide organization
- Extensive training on the IBM/370 concentrating on data based and on-line systems
- Free training materials
- Nation-wide assignments in the U.S.A.
- World-wide assignments upon return to the U.K.
- Relocation air fare paid to the U.S.A. as well as return fare to the U.K.
- Generous cash allowances in addition to air fare
- Dependent relocation paid in full
- Paid vacations
- Paid holidays
- Free medical insurance
- Free life insurance

Expense paid interviews in London during week of January 15, 1979.

To arrange a confidential interview at our London office, send resume immediately or telephone Miss Angela Nanni at our office, beginning Monday, January 15, 1979. (reverse charges accepted).

informatics inc

Africa House
64-78 Kingsway
London WC2B 6AL
01-405-8546

Director of Systems Planning

LOCATION: Brighton

SALARY:
Extremely competitive
Other benefits include mortgage subsidy and company car

Our cliant, the Card Division of the American Exprass Company based in Brighton now wishas to racruit a Director of Systems Planning. Tha position which is completaly naw, will be responsibla for all hardwara, softwara and businass syatams planning within tha Management Sarvicas Group of the Card Division.

Wa are looking for someona within an aga bracket of 30-40, who has had axparience of working in a large usar anvironmant or a computar consultancy, whara his or har responsibility will have coverad soma of tha things mentioned in the previous paragraph.

Currently, American Express are establishing a department which will ba rasponsible for all aystama planning, and ona of the mejor responsibilities will be to develop this department and ensure thet tha proper sarvice is provided to thn Systams Davalopment Group and the Oparations Group, as woll as the users of Computar Sarvicas.

Tha successful candidate will be awara of the impact naw hardware and softwara can maka on business docisions, and will hava the ability to harnass hardware and softwara to both long and short ranga and businass planning.

Tha businass opportunity is exceptional. This position is saan as ona of the most important appointments within the computar group. If you faal you hava the kind of axparience indicated by the job titla and tha description given, plaasa aand a comprahensive curriculum vitaa to John Goldsmith, with a contactabla talaphone numbar.

Raf: 2168/C

Computing Services Association

WE ARE ALWAYS INTERESTED IN HELPING YOU WITH YOUR CAREER
John Goldsmith (Computer Recruitment) Ltd., 15, Buckingham Palace Road, London, S.W.1.
Tel: 01-828 5356 – 24 hour answarphona sarvica.

RECRUITMENT CONSULTANTS

JOHN GOLDSMITH (Computer Recruitment) Ltd.

Lecturers

Hardware & Software
West London or North Cheshire
£6,500-£8,000 dependent on experience

Our Clients are a progressive and well established computer manufacturer with an excellent reputation in both the commercial and scientific markets.

Rapid expansion in the U.K. has created the need for more lecturing staff with hardware or software skills. Previous lecturing experience is essential at the senior end of the scale but not so at the junior end.

Hardware lecturers should have good in-depth electronic backgrounds with suitable qualifications and actual computer hardware experience would be particularly useful. Software lecturers should have good backgrounds in commercial languages and operating systems.

The positions in North Cheshire will be based initially in West London (probably for about 6-9 months) and during this time, accommodation allowances will be negotiated on a five-day week basis.

Interested candidates should telephone BOB BOWER the Advising Director, to arrange an interview.

Reference CW/219/1

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.

TELEPHONE: 01-353 7141 (24 HOURS)

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

Marketing Specialists

Central London based with some European travel
Circa £7,500 basic plus bonus and attractive tax-free car allowance

Our Clients enjoy one of the best reputations in the world for marketing and training resources. Enhancement of the U.K. Marketing Department has created two further vacancies.

Product Specialist

To take responsibility for the marketing of a specific product. The job includes pricing, stocking, configuring, creation of literature and sales aids, training, liaison with the Company's European Headquarters, support at large sales negotiations, presentations, analysis of competition and general support at a senior level.

Candidates should have a good knowledge of applications software and operating systems and an appreciation of hardware technicalities and COBOL.

Application Specialist

To control specific applications areas relating to Trade and Industry and in particular such areas as depot accounting and other distributed data processing applications.

The job involves researching specific applications areas, helping to create packages, planning sales campaigns, training, running sales workshops together with product specialists, supporting large sales negotiations, and generally offering troubleshooting and support back-up at a senior level. Applicants to the job will clearly identify closely with this specification and have the necessary experience upon which to draw.

Applicants to both positions could come from a variety of backgrounds such as sales, marketing, support, software house, large commercial T.P. user etc. Preferred but not essential is an age group of between 28 and 35 and an education to Degree or equivalent.

These are two first class opportunities and interested applicants should contact BOB BOWER Advising Director to arrange an early interview.

Reference CW/219/2

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.

TELEPHONE: 01-353 7141 (24 HOURS)

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

Herts

Product Manager

£9,000 + Generous car allowance

We are looking for a Manager to take full marketing responsibility for the software of our Clients, a leading computer manufacturer.

This responsibility includes keeping up to date with the latest software developments, defining the market size and requirements, planning and implementing product promotion and product launches, planning and implementing sales literature and training.

Business Analysts

£8,000 + car allowance

One Analyst is required to help install a ledger package and provide subsequent support, and one to help install a payroll package.

Once the packages have been taken on, the work involves assisting in defining and solving customer requirements and assisting in the installation of the packages and the provision of subsequent support.

Good communication skills and a willingness to travel are required together with two years COBOL experience and experience in analysing and installing either ledger or payroll systems.

For further information, please contact MARK IRENS.

Reference CW/219/3

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.

TELEPHONE: 01-353 7141 (24 HOURS)

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

Computer Sales Executives

London, Midlands, The North, The West
Salaries to £8,000 Quota Earnings £20,000

We have been instructed by our Clients to identify the really top-class sales executives of 1978 whose ambition should lead them to even greater things (earnings, responsibilities, benefits etc.) in 1979.

You may not be considering moving from your present company at this time but we would still like to know about you if you are doing well.

You should know exactly what the opportunities are at the moment and we should certainly know if your success and ambition could lead to a better job, either now or later.

Make certain that we know about you by contacting Mark Irens to arrange a meeting anytime between 8 a.m. and 6 p.m.

Reference CW/219/4

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.

TELEPHONE: 01-353 7141 (24 HOURS)

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

SYSTEMS ANALYSTS

South Yorkshire/Sheffield
to £5,750

Excellent career development opportunities for young Systems Analysts with our clients in South Yorkshire/ Sheffield.

Applicants should have:
* Good education
* 3 years DP - including 1 year systems analysis

Our clients offer:
* Starting salary to £5,750
* Full relocation expenses

Contact Ivor Norton quoting reference CW/79004

Ivor Norton Management Services Ltd
Recruitment Consulting Division
52 Shaftesbury Avenue, London W1V 7DE 01 734 6862 (24 hour answering service)
P.O. Box 83, Copthall Tower House, Harrogate HG1 1TS. Tel: Harrogate 66628

Opportunities for Programmers in computer aided design

Software Sciences Engineering is a specialist subsidiary within the UK's largest computing services organisation. Based in Rugby, the company provides a computer-aided design and draughting service to engineering industry throughout the UK. Customer demand has created a number of career openings for experienced programmers seeking challenge and variety in their work.

We are looking for candidates, educated to degree level, with practical experience in:

Engineering – *there are two opportunities for people with an engineering background plus FORTRAN programming experience. Knowledge of draughting, component design, or finite element analysis would be an advantage.*

Mathematical computing – *we also have an opening for a specialist with FORTRAN and machine code experience (Prime 300 or other mini).*

Successful candidates will be working in areas where they will have the satisfaction of seeing immediate benefits from the practical application of their skills. In particular their work will include:

contributing to the further development of our SWIFT computer-aided design/draughting system;

writing special-purpose facilities into SWIFT in response to individual customer requirements;

developing specific new programs for our clients in all areas of computer aided design and manufacture and engineering graphics.

At Software Sciences Engineering you will be getting the best of both worlds – the chance to make your mark in a small company where each individual really counts *plus* the benefits, prospects, and stability offered by a major computing group where success depends on its understanding of the needs and ambitions of its professional staff.

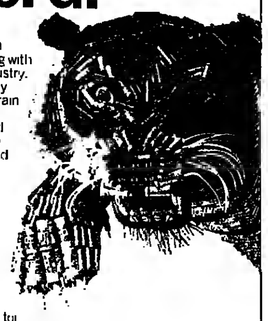
If you are interested in this vacancy, please contact Maureen Smith at Software Sciences Engineering, by letter or telephone, for an application form.

Based at Rugby
£4500 to £6000

Software Sciences Engineering Limited
Citycross House, Railway Terrace, Rugby, Warwickshire CV21 2DH
Telephone: 0788 75197

At Honeywell we really appreciate SALES EXECUTIVES...

...in every sense of the word!



There is much more to a selling job with Honeywell than just the prestige of working with one of the top names in the computer industry. In every way our sales executives are highly valued employees. We pay them well, we train them thoroughly, we support them with enthusiastic and highly competent pre and post sales support technicians, we provide them with real scope for creative selling and above all, we ask them to sell a range of computers which is at the forefront of technology and performance.

Levels 62 and 64

All over the United Kingdom our business is expanding rapidly, with particular success in

East Anglia

where our growth has created the need for further SALES EXECUTIVES based at our COLCHESTER offices. This operation is well supported with demonstration facilities, highly qualified support personnel and a wide range of existing clients.

We generally expect our sales executives to earn between

£11,000 and £14,000 per annum

as well as providing them with a company car and a variety of fringe benefits, but of course this income range excludes our 'high-fliers'.

If you are already a successful sales executive with over 2 years direct experience of selling commercial applications systems and feel that your career path is in need of enhancement, we'd like to meet you – wherever you are!

Please quote reference HEA 019 to:-
SMR Sales & Marketing Recruiters Ltd., Victory House, 99 Regent Street, London W1R 7HB. Telephone: 01 734 9776.

SENIOR CONSULTANT

Aslib has provided a specialist consultancy service in the field of information management for over ten years. Our clients have included industrial and commercial companies, professional institutions, government departments and international organisations. Our work is varied and involves:

— designing and setting up new information systems or libraries of various kinds;
— reviewing and evaluating existing services and advising on their future development;
— advising on the use of specific techniques (including computer techniques) for information handling or library processing;
— undertaking contract research.

We are now seeking a SENIOR CONSULTANT to join our Research and Consultancy Division. The essential requirements for the post are:

— a keen interest in the solution of complex and often novel, problems in the information field;
— objectivity in gathering and analysing the data on which decisions can be based;
— ability to communicate the results and conclusions of an investigation to the client organisation.

The kind of person we are hoping to recruit could be a practising information scientist with a flair for systems design, or a specialist from the field of computer science with an interest in information problems. Our offices are in London, and the work entails a certain amount of travelling. The preferred age group would be 28-40, and a degree and/or professional qualification would be required. The position is in a grade with a salary ranging upwards from £6,000.

Application forms are available from Pat Gros at Aslib, 36 Bedford Row, London WC1R 4JH. Tel: 01-242 4282.

Aslib

Data Base Administration

As an International Marketing Research Company and a leader in the business information service, we require someone with a good background in Commercial Systems to introduce Data Base to the United Kingdom.

Our Head Office is located in a rural setting on the outskirts of Oxford. The installation comprises an IBM 370-145 running under OS/VSI and a DEC PDP 11/34 running under RSTS/E.

If you have a good knowledge of one or more OS/OC System for IBM hardware and a couple of years' experience in designing and implementing OS/OC Systems, we'd like to hear from you.

In return, we can offer you a challenging and rewarding job, there'll be some travelling to Europe and a sterling salary up to £7,000 and an annual bonus and results-orientated management appraisal. Full re-location expenses will of course be met where appropriate.

For an application form, please telephone or write to: Mrs. Carol Nayne, Personnel Services Manager, A.C. Nielsen Company Limited, Nielsen House, Headington, Oxford, Telephone Oxford 64881, Ext. 202.

NIELSEN

Renowned and financially independent European

ELECTRONIC GROUP

(turnover more than 100 million US Dollars in 1978)

with manufacturing facilities for electro-mechanical and electronic products, R & D departments, world-wide patent rights and own marketing and service organization operating internationally

is looking for a

COOPERATION PARTNER

for most modern production plants in
- IRELAND
- GERMANY
- AUSTRIA
- OVERSEAS COUNTRIES

The cooperation may cover:
Mutual financial participation, production and marketing.

Serious and precise offers to our fiduciary agent:
ILANZER-VERWALTUNGS AG,
P.O.B. 170, CH 7130 Ilanz/Grisons, Switzerland

Analyst/Programmer Shannon

- Our client, Univeraal Management Ltd. which manages Univereal Inaurance Co. of Ireland Ltd., is currently installing an NCR 8250 in Shennon.
- The Company seeke en enalyst/programmer who will report to the chief accountent and be responsible for the systems and programming function in the organisation.
- Candidetes, likely to be in their mid to late twanties, will have at least two years' COBOL programming and one yeer's systems anelysis experiance. Previous experience in the insurence industry would be desirable but not essential.
- Training and familiarisation for the poaition will be given in Shennon, Bermude and possibly other overseas locations where similer systems are already in operation.
- This position should appeal to an energetic self-starter who would welcome the opportunity to exercise initiative and assume increasing responsibilities in a developing and progressive organisation.
- The company offers attractive conditions of employment including a salary in the region of £7,000.

Those who wish to be considered for the above position should apply for a personal history record form, in confidence, to:

Price Waterhouse Associates
Management Consultants
MAS 1728
Ballsbridge, Dublin 4

MYRIAD OPERATIONS
Computer Personnel Consultants

OPERATIONS SUPERVISOR

BASILDON **c £4250**

We are seeking a self-motivated person to take control of a new IBM installation. Our client is to install the new 8140 distributed processor at their computer department in Basildon.

The person appointed will be responsible for the management of the established operations area and could expect to gain promotion to Operations Manager in the near future.

Applications are invited from Senior Operators, preferably with an IBM 370 background and knowledge of OS JCL.

The position offers both the opportunity to gain management experience and the potential to progress to total control of the operations area.

Ref. SE/2/1101

24-hour answering service
Please telephone for a confidential discussion or write
311 Fleet Street London EC4 1AX
01-353 0981

KUWAIT — TAX FREE APPOINTMENTS

SYSTEMS ANALYST — £14000) PLUS
PROGRAMMERS — £13000) BENEFITS

THE COMPANY
We are a major trading group in Kuwait with diverse interests in automotive sales, domestic appliance retailing and contract engineering

THE INSTALLATION
We have been using computers to help run our company since the early 70's. Our present computer is a NCR Century 201 operating under 'B3' running a mix of online and batch systems. Later this year we plan to upgrade to a NCR Criterion 8550 using VRX and the TOTAL database management system
We intend to develop several new online systems and require additional analysts and programmers to help us do so

THE ANALYSTS
The people we are looking for will be able to demonstrate the following
* At least 3 years' experience as a Systems Analyst
* Significant experience in Hire Purchase or Retail Finance applications
* Experience of On-Line systems design
* Responsibility for the design and implementation of at least one major system.

In addition they must be self-motivated, innovative and capable of acting as an in-house consultant to the user department.

THE PROGRAMMERS
Applicants for the programming position will ideally have the following experience
* At least two years' programming experience using NEAT/3 and COBOL
* Working knowledge of NCR Century operating systems.
* Experience of structured and modular program design.
* Supervisory experience.
** Applicants with previous NCR online programming experience are especially welcome

THE BENEFITS
Our contracts are of 2 years' duration and are renewable. The emoluments quoted above which include salary and housing subsidy are tax-free and permit the accumulation of substantial exportable savings
Additional benefits include a Company air-conditioned car, interest-free furniture loans, and paid leave equivalent to 60 days per contract.

THE APPLICATIONS
Interested persons should send an updated C.V. to MRS. SUSAN HOLLEY, 6th FLOOR, SILVER CITY HOUSE, 62 BROMPTON ROAD, LONDON SW3 1BW, quoting reference R2406. All applications will be acknowledged and forwarded to our EDP Manager in Kuwait for selection of candidates for interviews in London.

monklands district council

The Council invites applications from suitably qualified and experienced persons for the following posts.

DEPARTMENT OF FINANCE AND MANAGEMENT SERVICES
Computer Section

Computer Operator

H.G. £2,967-£3,249 + £312 p.a. Supplement
Ref. No. 03/62

A vacancy has arisen for an operator for the Council's ICL 2903 with 32K memory, 3 x EDS 60s, 6 x DOE stations and various terminals, both local and remote. Applicants should have one year's experience of operating, preferably on ICL equipment under GEORGE II or EXEC 1 or 2 operating system.

N.J.C. Scheme of Salaries and Conditions of Service for A.P.T. & C. Staff will apply.

Application forms are available from the Personnel Officer, Monklands District Council, Municipal Buildings, Dunbeth Road, Coatbridge.

Completed forms should be returned by 24th January, 1979.

J. B. NESS
Chief Executive

Hintons

ARE YOU AN EXPERIENCED PROGRAMMER — IS IT TIME YOU CHANGED YOUR JOB?

Why not contact us for an interview

We have recently up-graded our computer and are about to do so again. We are now embarking on an interesting new major development including on-line systems. We require additional Programmers to supplement our present development team.

We are looking for capable Programmers with two years Cobol experience, and the ability to work to a restricted schedule. Experience of programming for a multi-programming machine is not essential but would be a distinct advantage.

We can offer suitable applicants interesting work in our modern offices where canteen facilities are available on the premises.

An attractive salary will be paid to the successful applicants and bonus schemes are in operation.

Written applications in the first instance please giving details of employment to date and when available for personal interview at Head Office, Thornaby, to:-

Group Manager, Personnel Services
ARNOLD HINTON & SONS LTD.
P.O. Box 24, Mainer Road, Thornaby, Cleveland
Tel: Stockton 68123, Ext. 237

Communicate with Racal

The Sales Challenge of 1979

Data Communications

RACAL

Racal-Milgo Limited is already the leading Data Communications Company yet is planning the largest growth in business in its history

The market is huge, the products are without equal and the rewards are high

Ambitious people (male/female) are now sought to join the successful UK Direct Sales Team in the following capacities

Area Sales Engineers
– to sell our comprehensive range of data communications equipment to computer based users within defined territories

Applicants should have either selling experience in the communications/computer fields, or engineering backgrounds and strong desire to break into the commercial world. All necessary training will be given

These positions will be based at our Reading, Manchester or Birmingham offices, and will command attractive base salaries, generous commission and a Company car

Internal Sales Engineers
– to co-ordinate the activities of the Field Sales Team and to actively support prospects in the pre-sales stage. This involves extensive customer contact and liaison with all Company departments.

Applicants should have an electronic technical bias and a good telephone manner preferably gained in a commercial environment

These internal positions (in Reading or Manchester) can lead to Field Sales appointments.

In addition to competitive salaries, the Company offers over four weeks annual leave, a first class contributory pension scheme with free life assurance and relocation assistance where appropriate

Ring for an application form, or write with personal and career details to

D. J. Kichenside, Personnel Officer, Racal-Milgo Limited, Prospect House, Thorn Street, Reading, Berkshire
Telephone: Reading 595314

Servelec

ANALYST/PROGRAMMERS TO £6,500 + BONUS

We are a young, expanding Computer systems house with a solid client base involved in micro/minicomputer based automation/control systems.

We are establishing project teams and require analyst/programmers with the following qualifications:
- 1-3 years' programming experience, including assembler language
- Ability to understand hardware
- Problem solving capability
- Professional outlook and ability to communicate

We offer rapid career development with regular salary reviews, staff pension and insurance schemes, together with all the usual company benefits.

CALL OR WRITE TODAY: John Archer BBR/VLEC COMPUTER SYSTEMS LTD., Churchill House, Talbot Road, Old Trafford, Manchester M16 0PD. Telephone (061) 872 0880 or Wilmslow 021 491 (evenings).

DATAFORCE

PERSONNEL & COMPUTER CONSULTANTS

AUSTRALIA

SYSTEMS ANALYSTS–SYSTEMS PROGRAMMERS–PROGRAMMERS

Data processing in Australia is currently at a peak and rewards are high. If you are interested in employment prospects in Melbourne and Victoria, Dataforce wants to talk to you. One of our Directors will soon be conducting interviews at Victoria House in London, and in Birmingham and Bristol. Call one of the numbers below to arrange a time when we can discuss your requirements and indicate likely prospects and salaries. Feel free to involve other members of your family in these sessions. Information will be made available on the cost of living in Australia and every attempt will be made to answer your questions.

UNIQUE SCHEME:– as well as finding you employment, Dataforce offers participation in a unique scheme whereby if, after 90 days, you are in the same employment that we arranged, you will receive a bonus equivalent to 2% of your annual sterling salary. This bonus is independent of your new employer.

Telephone: 0625-403081 London 0213-511404 Birmingham; 0225-22359 Bristol
Dataforce Pty. Ltd., 101 Toorak Rd., South Yarra, Vic., 3141 Aus. Phone 267 5677

UNIVERSITY OF SURREY

COMPUTING UNIT

ANALYST/ PROGRAMMER

Salary scale to £6555 per annum
(under review)

The Data Processing section of the University's Computing Unit has a vacancy for an Analyst/Programmer to be responsible for all computer systems required by the Library and Bookshop. Duties include systems analysis, specification, design, programming, testing, documentation and implementation. First priorities will be the development of a completely new system to control the ordering of books, and the provision of online functions for book borrowing and reservation.

Some successful system design work, and at least two years' programming experience (Cobol or similar) are essential requirements; but experience in particular applications, or with particular computers, is less important than the personal qualities of adaptability, self-motivation and an ability to communicate.

For further details, or to arrange an informal interview, please telephone Mr. A. Hall on Guildford 71281, Ext. 730.

Applications in writing, including the names and addresses of two referees, should be addressed to the Staff Officer, University of Surrey, Guildford, Surrey GU2 5HX.

Programmer

Wrexham

Air Products Limited is a leading manufacturer and distributor of industrial gases, operating plants and depots throughout the U.K.

We now require a Programmer at our Engineering Works at Wrexham in North Wales. Part of an international organisation, the company operates computers and terminals throughout the UK, Europe and the U.S.A.

The European operation is served by an IBM 360/65 750 megabyte computer and the Engineering Works operates a large Data 100 terminal link with various other TP options.

We expect the successful applicant to have a basic grounding in COBOL with experience on commercial systems. Training in other aspects will be given. Salary will be in excess of £5,500 and is currently under review.

Please apply in writing to:
The Personnel Manager, Air Products Limited, Acrelei, Wrexham, Clwyd, N. Wales.

Air Products

Analyst/ Programmers

Halstead, Essex

We are the European Medical Division of Corning Glass Works – a large US multinational corporation. We develop, manufacture and market in-vitro clinical instruments.

We now have opportunities for a number of Programmer/Analysts to take responsibility for:

- examining proposed information systems
- preparing projects and agreeing their specification with relevant departments
- planning, writing, testing and documenting programs to run on the computer
- providing operating instructions together with standard utilities for the execution of a given system.

Educated to 'A' level standard, successful applicants will have 18-23 months experience of RPG II/System 3 and the ability to work effectively in a small team.

We offer an attractive salary and generous benefits package including relocation costs where appropriate. Career prospects within this worldwide Group are excellent.

For further details and an application form, please contact Brian Murray, Personnel Manager, Corning Medical, Corning Limited, Northern Road, Chilton Industrial Estate, Sudbury, Suffolk CO10 6XD. Tel: Sudbury (07873) 76481.

CORNING

Project Leader

Salary scale £7,466-£7,979 per annum

Required for our offices in E.C.1.

The successful candidate will manage a team of system analysts and programmers in the day-to-day maintenance and production of new suites of programs. Four years' experience of programming and systems analysis, two in a senior role, are a minimum requirement. Knowledge of Informatics MARK IV, COBOL or APL would be an advantage but more weight will be given to evidence of leadership and organising ability.

We operate two IBM 370/148 computers connected to a large teleprocessing network. Interesting developments in this network are in hand involving the evaluation of IBMs Series/1 and similar equipment. The software environment is DOS/VS under VM, utilising CMS for on-line program development. Batch work is handled by Informatics MARK IV.

Generous holidays — Staff restaurant — Flexitime.

If interested, why not ring Mike O'Meara on 01-837 3300, Ext. 2331/1330 for further information and an application form, or simply send concise details of your qualifications and career to date, and quoting reference CW to: Laurence O. Wild, CEng, FICE, FIMechE, FIWEM, Divisional Manager, Room 650, Thames Water Authority, Metropolitan Water Division, 173 Rosebery Avenue, London EC1R 4TP.

The post is open to male and female applicants.

Thames Water

Computer Operators

Rutherford Laboratory

Vacancies for Computer Operators have arisen at Rutherford Laboratory, at Chilton (near Didcot, Oxon.).

The Computer Operations Group runs an extensive computing service for the Science Research Council. Two large IBM 360/195 computers are in use, supported by an international network of work stations and terminals.

A Univac 1108 installation will also be added to this configuration in the next few months.

Previous experience, with either IBM or Univac equipment, whilst not essential, would be an added advantage.

Since the computers are in continuous operation, candidates must be prepared for varied shift work, for which additional allowances will be paid. Working conditions are excellent – there is a restaurant as well as shopping and recreational facilities – and shift transport runs to selected local centres. Plus generous holidays, sick leave allowance and contributory superannuation scheme.

Salaries will be related to the following grades, depending on qualifications and experience:-

S.O. – Degree or HNC in Mathematics or Computing. Salary £3037-£4721.

A.S.O. – GCE O level in 5 subjects including English Language and a Science subject. Salary £2341 (age 18) £2861 (age 21) £2922 (22 or over) rising to £3541.

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DATA PROCESSOR (After training) £15.92 – £53.66 per week.

Contact Ruth Jeans in the Personnel Group on Abingdon (0235) 21900 Ext. 510.

Or write to her quoting reference VN 765.

Closing date for applications January 26th 1979.

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Science Research Council
Rutherford Laboratory, Chilton, Didcot, Oxfordshire OX11 0QX. Tel Abingdon 21900

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Central Scotland

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The position requires an individual with proven experience in leading a team of DP personnel and has the ability to control and motivate staff. The successful candidate will be responsible for a Honeywell D8 which will be used to run manufacturing systems on a Real Time Candidates should also be able to communicate to control and educate users in new computer techniques. The position offers the opportunity to work in a modern developing DP environment where innovation is encouraged and suitably rewarded.

A competitive starting salary is offered together with all of the benefits usually associated with a large progressive organisation including relocation assistance where necessary.

Please reply in writing, giving details of your career to date and quoting Reference R 4494 S, to

The Manager, Confidential Reply Service, MCS-ROBERTSON & SCOTT, MCS House, 23 Park Circus, Glasgow G3 6AS

All letters will be opened, acknowledged and forwarded to our client. Please list separately any companies to which your application should not be sent.

This vacancy is open to male and female candidates.

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General Accident, Perth, Scotland

Operations Development implement computer based business systems covering a wide range of insurance and financial applications. The tasks involved include the creation of user manuals, data input design, system testing and resolution of Users' queries.

In addition, a wide variety of support functions are performed for the Operations Section.

New equipment scheduled for delivery during 1979 includes an IBM 3031 4MB, 3350 disc drives, 3420 tapes and 3211 printer. A software upgrade to VM and MVS is commencing shortly.

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General Accident

SYSTEMS ANALYST/PROGRAMMER
(Ref. RN.545)
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£5,682-£6,084 p.a.

Applications are invited for the above post in the Computer Services Technical Systems team based at the Authority's computer centre in Central Bradford. Duties include the provision of support to engineering and scientific users and the development and implementation of a wide range of technical programs and packages on the Authority's ICL 2970.

Applicants, male or female, should hold a degree, preferably in Mathematics, Engineering or a Scientific subject and have had at least three years' practical experience in the technical computer applications field. A working knowledge of one or more of FORTRAN, ALGOL, BASIC or COBOL would be an advantage.

Relocation expenses and disturbance allowance are payable in approved cases.

Application forms are available from the Regional Personnel Officer, Yorkshire Water Authority, West Riding House, 67 Albion Street, Leeds LS1 5AA (Tel. Leeds 448201 ext. 269), to whom they should be returned by 15th January, 1979, quoting the appropriate reference number.

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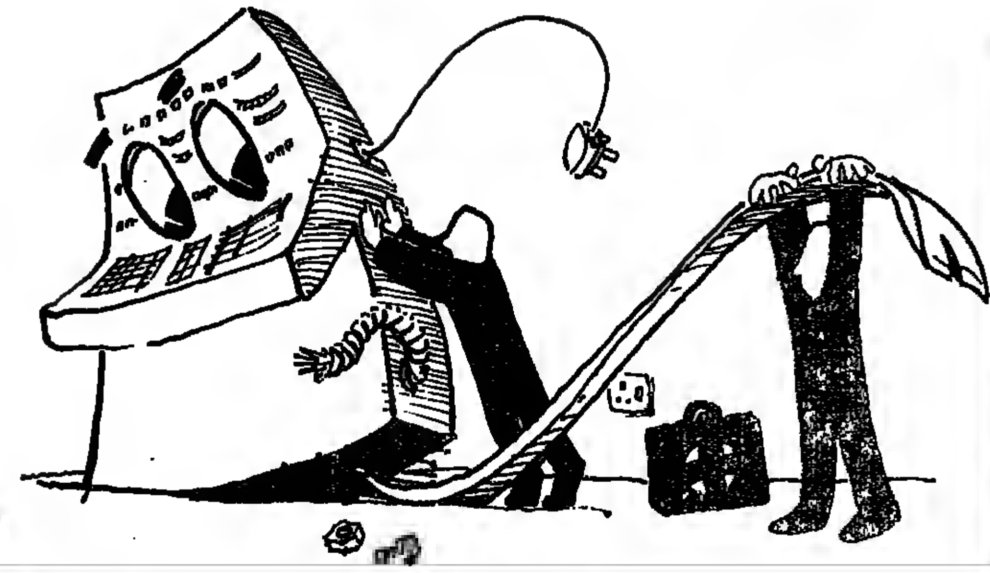

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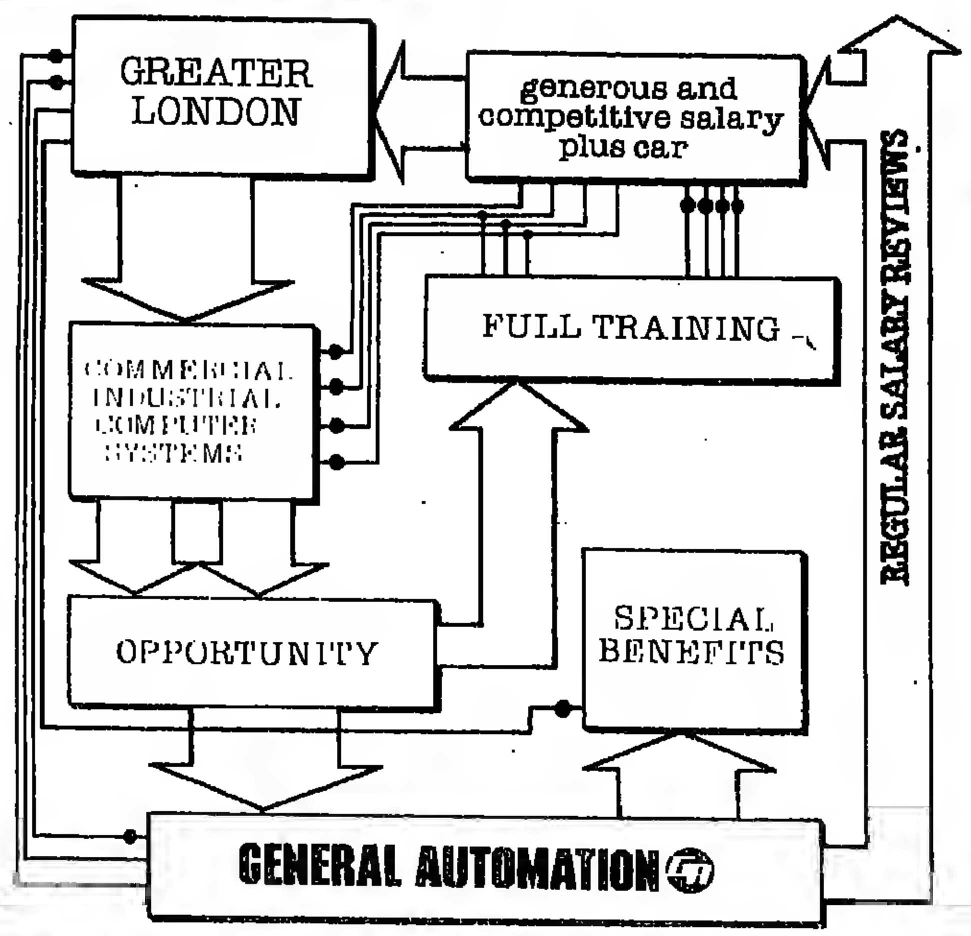

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1979
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The successful man or woman is likely to have had at least three years' experience of working in an IBM installation, preferably in a supervisory capacity. A working knowledge of RPG II and the ability to assist in system maintenance activities will be an added advantage.

The position offers the ambitious operations supervisor the opportunity to gain management experience and there are good possibilities for career development with this expanding group.

Please send concise details of your education and experience to:–

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FERODO

SENIOR SYSTEMS ANALYSTS

THE COMPANY
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OUR COMPUTER
Ferodo Limited is part of the Turner and Newell Group and is one of the unit companies using a centrally located IBM 370/168 running under OS/VS1 and using IMS. We are shortly upgrading to MVS. Some of our systems are still running on our locally based ICL 1902T but these are rapidly being transferred to the central IBM machine.

THE JOB
The successful applicants will be involved in new developments concerning Factory Loading, Progress Control, on-line Order Processing and Group Accounting Systems which will include an on-line Sales Ledger. Full training will be given where necessary.

THE APPLICANTS
The job calls for 2-3 years' experience and achievement in commercial systems analysis, design, development and implementation.
Educational requirements are qualifications at "A" level standard or equivalent and preferably a degree.

We offer Competitive Salaries according to experience and suitability and the benefits package includes membership of the excellent Turner and Newell pension scheme, free B.U.P.A. membership, four weeks' holiday, assistance with re-location expenses, etc.
We work a 5-day 37-hour week — 8.30 a.m. to 4.30 p.m.

To find out more about this job, telephone our Systems and Programming Manager, Brian Smith, on 029-881 2520, ext. 320, or alternatively, write for an application form to
The Personnel Manager, John Crowson, Ferodo Ltd., Chapel-en-le-Frith, via Stockport SK12 6JP.

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CICS

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Our client requires systems programming specialists initially with main-frame experience including either IBM, CDC, ICL 2900 or H. Previous in-depth experience is a pre-requisite. Our brief is to discover potential coupled with several years' current relevant experience for which our client expects to pay well above accepted market rates. These positions are permanent and relocation expenses will be covered in full wherever applicable. The client is a market-leader in advanced systems projects and is truly International in size and performance with offices throughout Europe, Australasia and the U.S. Interviews will be held in London.

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Data Express House
3 Prospect Place, Heathfield Terrace, Chiswick, W4, 01-995 3883

Name (full) Mr. Mrs. Miss	UCA No.
Address	Telephone (home)
	(used discreetly) (work) Ext
	Position required
Age Marital status	Salary required
Period of notice Children's ages	Areas required
Car owner/driver Foreign languages?	Willing to move? Within U.K. Yes/No Overseas Yes/No
Education — 'O'/'A' levels/degrees/other	Areas considered LONDON Yes/No
	Installation preferred
EDP courses	Join a progressive software house/Consultancy/Bureaux? Yes/No
	Interested in freelance work?

EMPLOYMENT RECORD

Dates & final salary (most recent first)	Employers (most recent first)	Computer & model	Programme languages & operating systems	Position, duties and applications undertaken and completed

EDP EXPERIENCE

Time period to nearest quarter year: Operating Programming Sales/other
Control procedures Systems Management Total in DP
Languages and operating systems you know well

Assess your experience: S = some A = adequate F = full (leave blank if not relevant) of the following

VRC/Word Processing	Time-Sharing	Database Design	JCL	Microprocessors
Drum Disk	MICR/OCR	VDU	Data transmission	Real time
Software development	Scientific programming	Production control		Accountancy

HURRY POST NOW!
D.O.E. No. SE(A) 134

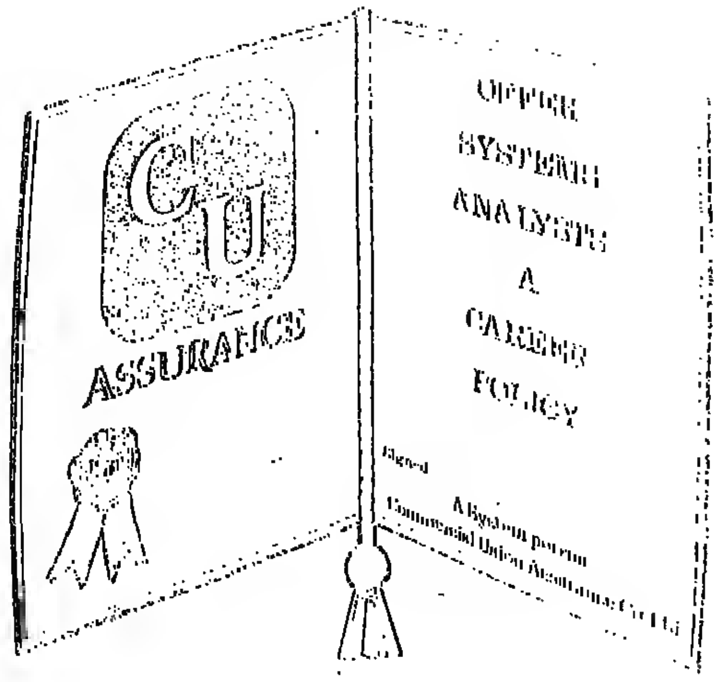
No stamp needed if you post to Universal Computer Associates FREEPOST, London W4 3BR (Please attach a C.V. if you have one)

To Our Mutual ...

Whyteleafe, Surrey.

Commercial Union Assurance offer the benefits of working for a major insurance company, in a modern, technical environment.

* Salary £6000—£6500
* Preferential Mortgage (5%)
* Low Cost Pension Scheme And Life Assurance
* Good Relocation Package
* 33½ hour, Flexitime Week
* Paid Overtime
* Free Lunches
* Easy Travel
* Excellent Working Conditions



What benefits do you need to offer in return?

* A minimum 2 years Systems experience
* Experience from feasibility to successful implementation
* A programming background
* The ability to work on batch, or on-line systems
* To work in the development of new and the enhancement of existing systems

Please telephone or write for further details.
Quote CW 104-9J

COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS
CAPP ASSOCIATES
LONDON AND MANCHESTER
Computing Services Association

HEAD OFFICE 01-686 9693 (24 HOUR ANSAPHONE) 19 PARK STREET, CROYDON CR9 1TR
NORTHERN OFFICE 061 236 9085 (24 HOUR ANSAPHONE) FAULKNER HOUSE, FAULKNER STREET, MANCHESTER M1 4YD

Head of Computer Operations

INTERNATIONAL BANK

LOCATION: City of London

SALARY: Circa £9,500 plus significant bank benefits

Our client is a very well known International Bank. They now wish to recruit someone to take complete charge of their Operations Department. Currently, the department is about 20 people strong and a major hardware upgrade is anticipated for the coming year. The department is already established but it is felt that it needs now to introduce a strong 'people and technical' manager.

We would therefore like to meet someone who has a record of management success in a computer environment. Ideally, the applicant will already be controlling an operations department, but could just as likely come from a systems and programming management position. However, the successful candidate must be able to supply positive leadership, enthusiasm and a proven ability to get things done on time.

The environment is a very time critical one, and to cope with this it is essential that existing standards are improved, and where they are lacking — provided. You must also be able to communicate effectively and relate to members of staff at all levels. A banking background would be considered an advantage, although this is not essential. Certainly, experience of working in a financial environment is desirable.

We are looking for someone who will quickly improve the performance of this department and will understand the necessity to be 'on call' at other than normal working hours when the situation so warrants. If you feel you have the dynamism and the ability to take this important challenge, we would like to hear from you. Please send a history of yourself to John Goldsmith.

Ref: 2167/CW

Computing Services Association

WE ARE ALWAYS INTERESTED IN HELPING YOU WITH YOUR CAREER
John Goldsmith (Computer Recruitment) Ltd., 15, Buckingham Palace Road, London, S.W.1.
Tel: 01-828 5355—24 hour answerphone service.

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JOHN GOLDSMITH (Computer Recruitment) Ltd.

£neg. CONTRACT PROG. Switzerland
PDP 11/34 bureau installation. Must have RSTS. Immediate position. Accounts systems experience preferred.

c£6K + car SYSTEMS MANAGER S. Hants
Ideally with an O & M background with manufacturing industry experience for IBM S32 installation. Full relocation exes if appropriate.

c£4.5K JNR. ANAL/PROGS. Bucks/Suffolk
Minimum six months experience and knowledge of RPG2 for junior positions in development team with Burroughs installation

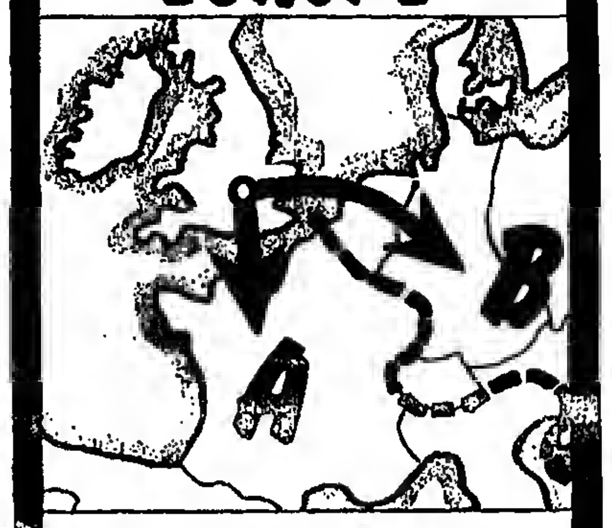
£4K JUNIOR PROGRAMMER Herts
At least one year's experience for new Honeywell installation using RPG2. Lots of growth in well-established international company.

168 Finchley Road, London, NW3 6HP

OCC Computer Personnel Limited
16 Bedford Row
London
WC1R 4EB
01-242 9356

Please ring Renée Nute on 01-242 9356 or write to the address quoted
If it would be more convenient to telephone in the evening or during the weekend please ring 874 6372

Minicomputer MARKETING SUPPORT EUROPE



Up to £8500 + Car

BASED LONDON N.W.

Do you enjoy travel and variety? Have you got a sound background (defence, scientific or commercial) on minis or small business systems? Can you speak a foreign language?

If so, you could be interested in this London-based job with our clients, the market leaders in the word-processing field, currently experiencing tremendous growth. The job involves both pre-sales and post-sales implementation and support. Career prospects are excellent, and there may be an opportunity to relocate to Europe.

For Area A, Spanish or knowledge of some other Latin language would be particularly useful, but not mandatory.

If you are not so good at languages you could be on for Area B. However, candidates with some capability in German or another Northern European language would have an advantage.

Please ring us for a confidential discussion, quoting ref. 970 or leave a message on our answering machine after hours and we'll contact you.

EDP SYSTEMS 01.637 5796
52-53 Margaret St. London WIN 7FF

sems
THOMSON-CSF

Our clients "Société Européene de Mini-Informatique et de Systemes" is expanding its operation to the UK market. A member of THOMSON-CSF, one of the world's leaders in electronics SEMS is currently marketing worldwide a range of MINI Computers including the SOLAR and the MITRA series, offering a wide ranging involvement in the industrial, scientific and also business systems markets.

The following key positions are to be filled.

to £9,000 + car

A Support Specialist is required to provide essential technical support to the sales activity in the U.K. for SEMS products. Customers requirements will need to be analysed and defined to result in creative and professional proposals.
This position calls for sound experience in the industry, including mini involvement and a customer environment orientation, ideally gained with a computer manufacturer or a consultancy. *Ref: 500/CW/Renée Nute.*

to £9,000

The Software Support function will assume a strong technical involvement leading to the successful installation of basic software as well as implementation of customers systems. A deep technical background is essential, much of it gained in the mini computer field. Previous responsibility at an equivalent level would be ideal. *Ref: 501/CW/Renée Nute.*

£6,000-£7,000 + car

In addition to the vital Field service function to be established this leading engineer will take responsibility for the computer installation at SEMS new data centre.
A good customer engineering background, at product engineering level as well as field service experience in the mini computer industry is the requirement for this team founder.
Ref: 502/CW/Renée Nute.
All the above positions will offer team leading opportunities towards management for candidates with suitable personality, experience and ambitions. Exceptional candidates able to justify higher salary expectations than quoted above will be considered.

Product training on SEMS products will be given. The company will be based in the London area. Full conditions of employment will be offered including some relocation expenses if applicable.

Client interviews will probably start in London w.e.f. 19th January. Final interviews soon afterwards in PARIS.

Our offices will be open until 7.30 pm on 15th January for informal discussion.

Member of Computing Services Association

WORTHING BOROUGH COUNCIL

COBOL PROGRAMMER

Salary up to £5,073 plus Housing*

An ambitious programmer with good experience is required to take a leading part in the development of an on-line financial management information system using ICL 2904 hardware, 7502s and V.D.U.s. The work will be challenging and a high standard of output is sought.

*Housing accommodation available in appropriate cases and/or generous removal and resettlement allowances paid.

Excellent conditions including flexible working hours, good social facilities and staff canteen.

Salary up to £5,073 per annum offered to the successful candidate possessing the required ability and experience.

Telephone 0903 37111, (Ext. 47) for further details and an application form which should be returned to the Borough Management Services and Personnel Officer, Town Hall, Worthing BN11 1LS, by 26th January, 1979.

HOWARD

MICROPROGRAMMERS
MICROPROGRAMMERS
C£24,000 F.A.

ATTENTION ALL MICROPROGRAMMERS

We are in the process of recruiting three microprogrammers to join a small established team working on the continent. The positions are offered on a contract basis and for the right persons can represent involvement into late 1980. This is an opportunity not to be missed if you have microprogramming experience and wish to work overseas telephone now for more details Ref. 08080179.

The Overseas Recruitment Consultant
HOWARD ORGANISATION INTERNATIONAL LIMITED
Employment Business Section
8 Elstree Way, Borehamwood, Hertfordshire
Tel. 01-953 4066

UNIVERSITY OF LEICESTER

COMPUTER OPERATOR

The Computer Laboratory has a vacancy for an experienced computer operator. The Laboratory provides the central computing services for the University and associated Medical School using CDC Cyber 72 with a wide range of peripherals and a campus network based on PDP 11s. Knowledge of Control Data equipment would be a considerable advantage, but is not expected. Salary according to age and experience on a range from £3,074 to £3,774 with an additional £231 a year two-shift allowance.

Applications should be made to the Director, Computer Laboratory, The University, Leicester LE1 7RH, telephone number (0533) 50000, extension 42.

UNIVERSITY OF ABERDEEN

TEMPORARY PROGRAMMER

Applications are invited from suitably qualified persons for above post in Data Processing. The post is tenable for one year in the first instance, but may be extended.

An administrative/library computer (CTL 8050) has recently been installed and includes large disks, VDUs and light-pens. The initial applications areas will be library, finance and student records. A knowledge of COBOL is desirable.

Salary on Other Related Staff Scale IB (£3,384-£5,604) with appropriate placing.

Further particulars from The Secretary, The University, Aberdeen, with whom applications (2 copies) should be lodged by February 2, 1979.

THE NEW YEAR AT AMERICAN EXPRESS COULD OFFER YOU A WIDENING OF YOUR CAREER HORIZON

The Card Division of American Express continues to expand ite Computer Systems Group. They now have a requirement to recruit e number of staff to fill completely new vacancies. This is due to significant expansion of business and also a greater commitment to the development of computer systems that will improve the development of that business.

The positions advertised vary significantly in status and job content, and some form part of the International Systems Group. All positions offer excellent salaries and a large number offer a mortgage subsidy. There is a non-contributory life and pension scheme, plus e heavily subsidised staff restaurant. The working conditions are first-class, and being based in Brighton offers one of the most attractive locations in Southern England.

The vacancies fall into four mein categories:

Programmers
Systems Analysts
Research and Development Analysts
User Support Analyst

Briefly set out below are the ideal 'person specifications.' However, if you feel that you have other experience that can be utilised in a positive, fast moving group that is gradually moving to the front both in terms of systems and technology, then we would like to hear from you. We suggest you do this either by contacting John Goldsmith at the address below, or at his home on Camberley 21266 at any reasonable time, or better still, send e short history of yourself so that an appointment can be made to meet you.

Programmers

We are looking for Programmers and Lead Programmers. Experience ideally will be in an IBM environment, with a strong COBOL or Assembler background. Experience should extend from 1 year to 5 years depanding upon the level of position applied for. There are advantages in both positions; for more junior programming vacancies; full training will be provided to keep you up-to-date technically; at the senio level, you will have the opportunity to either manage people or assist in the management of people. The career opportunity cen later widen either into systems or into software. Ref. 2145/CW.

Systems Programmers

Systems Software Specialists

Again these positions vary in status and depend entirely on the length of time and the responsibility that one has had in tha area. We are looking for people with en Assembler background in an IBM environment with knowledge of OS/VS1. You also will have some of the following experience:

Performance monitoring, tuning eveluation and capacity planning. Softwars peckege evaluation in the fields of operations support, applications development and teating end productivity aids. If you have worked with ROSCOE, CICS/VS, DL/1, VSAM or VTAM, you are certainly someone we would like to know.

Again the cersar opportunity is a good one. An opportunity that can only be provided in a fast growing organisation such as American Express. Ref. 2146/CW.

Systems Analysts

We are looking for Analysts who have done things. Again, the length of experience and the responsibility achieved will decide your level of entry into American Express, but the opportunities are very good indeed. A number of major projects are at hand. There has been a significant 'look back' at systems already developed to bring them in line with the fast moving business of the Card Division, but an even greater 'look forward' to what is going to be required during the next few years. It is possible to use all the current 'buzz words' that are relevant to this kind of development, but perhaps it is enough to say that Amsrican Express are constantly bscoming much more demanding of their systems group, so the pressure will be there, and this is something you must clearly understand. However, so is the opportunity. Ref. 2147/CW.

International Systems Group

The Internetional Syetems Group is raaponsible for the development of systems in many parts of Europe. Some of the positions advertised will require some European travel. Two major projects are currently to hand, one is e Genaral Ledger project end the other is en Internetional Accounts Payable project.

Lead Programmer

We ere looking for someone with a strong Burroughs background. American Express ere installing herdware in the Burroughe 1700 renge in e number of European centres and they ere looking for somaone based in Brighton, to join them at e senior level within their programming group. Ideelly, you should heve between 2 and 3 yeers' experiance and be capeble of significent self-motivation and ability to work under pressure. Ref. 214B/CW.

Analysts

As previously mentioned, the systems developed in the Internetional Systeme Group are largely accounting beeed, therefore, we would like to meet Anelysts who heve experience of working in e financial systems environment. We hope thet they can bring knowledge of the two systems mentiond and will probably find the internationel aspect of this systems development e very interesting challenge. We are looking for paople at aeveral different levels and you should have et least 2 yeers' experience of working in e systems environment that has got things done.' Ref. 2149/CW.

User Support Analyst

This position, attached to the International Systems Group, is a very responsible and interasting one. It will require aignificant international travel in Europe. The job will be to write-up proceduras for new systems, generally advise users of their responsibilities and ensure thet adequate documentation is produced for new systems. Ref. 2150/CW.

Research and Development Analysts

The main responsibilities of the Research and Development Group will be to reaearch and evaluata new hardware end to assess new technology and products and their impact on the Card Division's business objectives. This new group hes responeibility for computer Reaearch and Development not only in the United Kingdom but elso for Americen Express' computer activities in Europe.

The main personal requirements ere: e detailed knowledge of systems design, experience of current computer hardware end some programming experience. A deta communications background would elso be e significent advantege. The selected applicents will be expected to operate at e senior level and therefore will be eble to negotiate confidently at all levels of management. Ref. 2151/CW.

Computing Services Association

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Goldsmith Recruitment International Ltd., 15 Buckingham Palace Road, London S.W.1.
Tel: 01-828 5356 – 24 hour answerphone service.

RECRUITMENT CONSULTANTS

JOHN GOLDSMITH (Computer Recruitment) Ltd.

GO WITH GAMMA IN '79

Gamma Associates is the leading supplier of DEC Computer Systems for commercial use in Europe. The Head Office is in Nottingham and there are other offices in the U.K. The Company's continuing growth offers considerable scope for advancement and has given rise to the need for additional staff based in Nottingham.

ON-LINE SYSTEMS DEVELOPMENT STAFF

PROJECT LEADERS
to c £7,500 + Benefits

* To assuma responsibility for the successful implementation of projects covering a wide variety of commercial applications.
* To advise on costings and pre-sales proposals and to be responsible for producing Functional and systems Specifications.

ANALYSTS
to c £6,000 + Benefits

* To work on the design of on-line applications and to be responsible for producing systems and programming specifications.
* To take responsibility for the system testing of completed applications prior to implementation.

PROGRAMMERS
to c £5,000 + Benefits

* To develop programs in an on-line environment to match program spacifications.
* To assist in the preparation of program designs as a basis for programming.

Commercial experience would form an essential part of the background of successful applicants and any previous involvement with on-line systems would be a distinct advantage.

Applicants should write or telephone for an application form to Mrs. Lynn Cox, Gamma Associates Ltd. Newland House, Mount Street, Nottingham. Telephone Nottingham (0602) 412788

GAMMA

SENIOR COMPUTER ENGINEERS

We would like to hear from top quality computer engineers with a minimum of two years experience on either LSI-11 (Q BUS) or 11 range (UNIBUS/MASSBUS) who with to join a rapidly expanding organisation. Rewards are above average.

Basic to £7,500 p.a.
* Company Car
* Free BUPA membership
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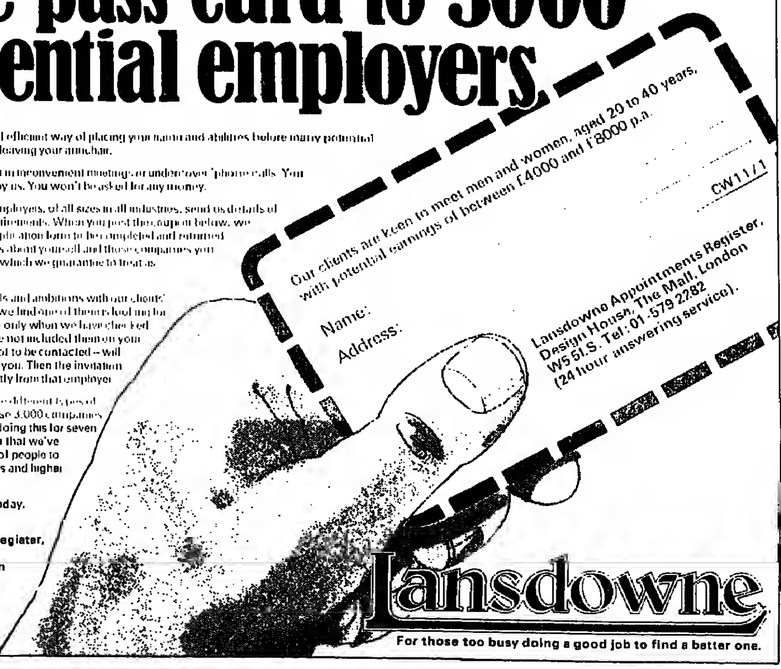
Thess positions will ba based in the Nottingham area. Applicants should either telephone Miss Claira Maxwell Nottingham (0602) 44376 or write to the Engineering Services Manager, Gamma Associates Ltd. 25 St. James's Street, Nottingham.

GAMMA

The pass card to 3000 potential employers.



Here is a unique and efficient way of placing your name and abilities before many potential employers without leaving your armchair.

It won't involve you in inconvenient meetings or endless 'phone calls. You won't be pestered by us. You won't be asked for any money.

Over 3,000 good employers, of all sizes in all industries, send us details of their personnel requirements. When you post the coupon below, we will send you an application form to be completed and returned with relevant details about yourself and those companies you don't want to join (which we guarantee to treat as confidential).

We match your skills and ambitions with our clients' needs. Only when we find one of them look right for someone like you – only when we have the feel again that you have not included them on your list of employers not to be contacted – will we tell them about you. Then the invitation to talk comes directly from that employer.

If you find all the excitement in good jobs offered by those 3,000 companies – and we've been doing this for seven years – you can see that we've helped thousands of people to better opportunities and higher earnings.

Post this coupon today.

Lansdowne Appointments Register, Design House, The Mall, London W5 5LS. Tel: 01-579 2282 (24 hour answering service).

COMPUTER OPERATOR

required by

AIRSPRUNG LIMITED
leading bedding manufacturer

Resulting from a significant growth in applications and from a general increase in the Company's activities, a vacancy has arisen for a computer operator with 1-2 years' experience. A knowledge of Burroughs equipment will be an advantage, but is not essential.

A two-shift system is in operation and the salary, commensurate with experience and qualifications, will be augmented by a shift allowance.

Applicants should write, giving full details of education and career to date and quoting references, to: The Personnel Officer, Airsprung Limited, Canal Road, Trowbridge, Wiltshire, BA14 8RO.

CENTRAL SOUTHERN ENGLAND

SURREY	Programmer/Client Exec.	£8-£7,000
SURREY	Junior Analyst (2 yrs. Prog.)	£4,500-£5,500
SUSSEX	Programmers	£8-£7,000
HANTS.	Senior An./Prog.	£8-£8,000
SUSSEX	Analyst/Prog.	£6-£8,000
SURREY	Operator	ERK package

ROS WILLIAMS has close contacts in the South
Telephone Today for an early interview

Management Personnel
2 Tunsgate Guildford Surrey
GUILDFORD (0483) 65566

APL Analyst/ Programmer

Rank Xerox (UK) are looking for an Analyst/Programmer preferably with previous Programming experience to join the Timesharing Applications unit within the O.R. Group situated at Bridge House, Uxbridge.

The work involves development of major APL applications and providing full support to internal users.

We are interested in meeting people with either APL, Fortran or equivalent scientific programming experience backed up by proven mathematical ability and good communication skills in view of the amount of internal liaison involved. We would also consider a recent graduate in a numerate subject ideally with some scientific or computer experience in which case full APL training will be given.

Salary level will vary according to age and experience but will be competitive and offered in conjunction with an attractive range of benefits and exceptional career prospects within a highly successful international organisation.

For further details please contact Denise Lincoln, Rank Xerox (UK) Ltd., Bridge House, Oxford Road, Uxbridge, Middlesex. Tel: Uxbridge 51133.

RANK XEROX

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LONDON HOLLAND to £6,500 A1 Neg.

Informatix has been retained by clients in the computer services industry to assist in the recruitment of permanent D.P. Staff.

The main prerequisites are a minimum of 18 months' programming experience, some systems experience and education to HND or 'A' level standard. All companies offer excellent career prospects.

For the positions in London, applicants must be capable of developing commercial programs to fixed time scales in either COBOL on ICL/IBM Mainframes or in an On-Line environment on minicomputers.

For the positions in Holland, practical experience of Software/Hardware on minicomputers is required, preferably with some graphics experience, to provide comprehensive sales and marketing support.

Ref. 2/1

INFORMATIX UNITED KINGDOM AND OVERSEAS INDEX

Haven Informatix Limited

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The right person could find themselves being the AREA MANAGER within a realistic time-scale

Applicants, male or female, should ring **Andy Graham on 031-226 1567** or write to:

ADP Network Services Ltd
57 Melville Street
Edinburgh EH5 7HL

Reed Executive
The Specialists in Executive and Management Selection

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West Midlands c £10,000 + car

Most companies are satisfied with only adequate management control and reporting systems. Not so with this company, a £15m subsidiary of a well-known engineering group manufacturing consumer durables. Reporting to the Managing Director, this position has been created to provide the expertise to investigate and improve existing systems across the company and recommend/implement new procedures for both current and future requirements. Candidates should therefore be fully conversant with main-frame computers and their application, with a probable background in Finance, O.&M. or Production Control, logical, thorough and expensive in approach and capable of further development.

Telephone 021-643 7226 (24 hr. service), quoting Ref: 1485/CW. Reed Executive Selection Ltd., 6th Floor, The Rotunda, Birmingham 2.

The above vacancy is open to both male and female candidates

London Birmingham Manchester Leeds

SMR Sales & Marketing Recruiters Ltd
Victory House, 99 Regent Street, London W1R 7HB

Sales Executives

If you are seeking to advance your career rather than simply looking for another job then you need the objective guidance of an organisation which is totally conversant with all aspects of sales and marketing within the computer industry.

Although our activities are devoted to this area, we are not merely a recruitment organisation; we are the only company within the industry which also provides sales training, market research and product promotion.

We understand sales people because we have done the job ourselves for a total of over 45 man years, and we know where the best job opportunities are because we have access to all the significant computer companies.

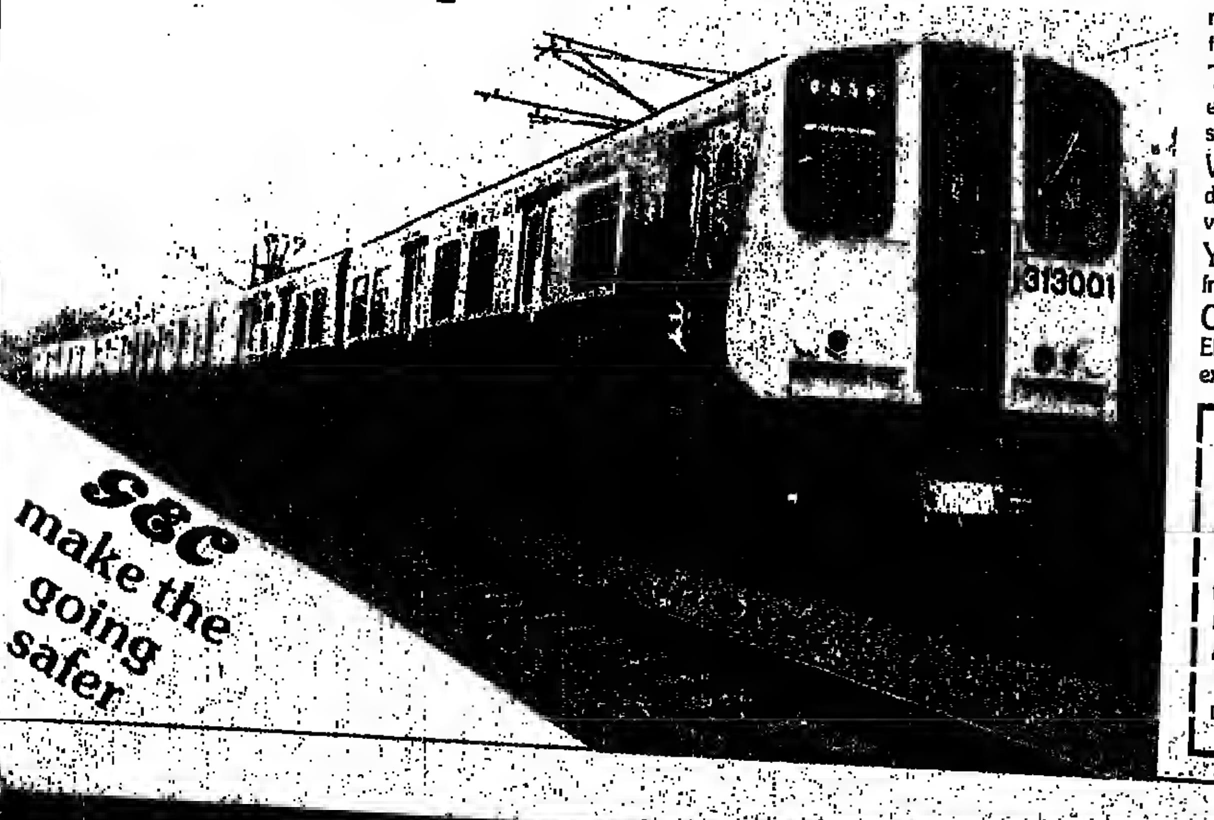
So give us a call if you need help of any kind; we believe there is still room for altruism in business. Who knows, you might even get to speak with TRADER!

Telephone 01 734 9776

A Sales & Marketing Services Company
TRAINING, PROMOTION, RESEARCH, RECRUITMENT
LONDON & MIDLANDS

PROGRAMMERS

up to £6,800 pa



WE PRODUCE systems using minicomputers and microprocessors to enable Railway Signal control of trains through some of the busiest junctions in the world.

THIS NEEDS co-operation between programmers and engineers from the laboratory through the factory and into the signal box.

WE WANT Programmers at all seniority levels to work on developments and projects. An engineering background is valuable but not essential.

YOU WILL have the satisfaction of seeing a job through from initial design to working on site.

CONTACT Mr. C. A. Porter, GEC General Signal Limited, Elstree Way, Borehamwood, Herts. Telephone 01-953 8211 extn. 3521, or complete the FREEPOST coupon.

FREEPOST – no postage necessary just write on envelope GEC General Signal Limited FREEPOST Borehamwood, Herts WD6 1BR

I have experience over

☐ 2 years ☐ 4 years ☐ 6 years ☐ longer

My present salary is in the range

☐ £4000-4500 ☐ £4500-5000 ☐ £5000-5500 ☐ Higher

Please tick alternative

Name

Address

Daytime phone No Evening phone No.

Ref. GS36

LONDON BOROUGH OF HOUNSLOW
BOROUGH TREASURER'S DEPARTMENT

SHIFT LEADER

Salary £3948-£4923 inclusive of 12½% shift allowance.

Applications are invited from experienced IBM Computer operators with good knowledge of DOS/VS operating system and multiprogramming using POWER/VS and Telecoms using CICS/VS and 3707 138.

2 shift system is in operation for which a shift allowance is paid. Occasional weekend working at overtime rates will be necessary.

Forms of application in reply to letters giving brief details of education and experience from Computer Manager, Borough Treasurer's Department, Civic Centre, Lampton Road, Hounslow, TW3 4DN. Tel: 01-570 7728, 3123/3125.

Closing date: 2 February 1979.

FREELANCERS
IBM COBOL contracts
All areas
Contact: JIM TAYLOR
Anglian D.P. Services Limited
Danbury 4255
(STD 024541)

REDIFON COMPUTERS LIMITED
COMPUTER ENGINEERS

with our continuing expansion we require computer engineers in the following areas:

London NE, NW, SE, SW, Central
Leeds/Shipley (on-site)
Ipswich
Bristol
Luton
Northampton
Swansea (on-site)
Coventry
Leicester
Leeds

We are looking for people, male or female, who have either a minimum of two years' experience on computing equipment and associated peripherals or formal electronics qualifications such as HNC or ONC plus digital experience, or relevant HM Forces experience.

Redifon offer attractive salaries, overtime and company car plus the normal benefits associated with an expanding progressive company.

M. Barnes
Redifon Computers Limited
9/27 Kelvin Way
Crawley, Sussex
RH10 2LY
Telephone No (Crawley) 31211 ext 278
Apply to above

The Polytechnic of North London

PROGRAMMING ASSISTANT

The Polytechnic is replacing its present computerised student registration system with one which will deal adequately with a constantly changing data base, provide outputs more closely related to the needs of its users and be based on sound principals of software design, implementation, documentation and maintenance. The system may form part of a more comprehensive data base for management information. A Research Fellow is currently drawing up proposals for this system.

A programming assistant is now needed to help with the completion of this proposal and work on its implementation. Full support will be available from the Registry, Computer Unit and computer science staff of the Polytechnic. The appointment will be for a period of up to two years.

Salary on a scale up to £4689 (including London Allowance). Commencing salary according to qualifications and experience.

Applications should be made to the Head of the Computer Centre, Polytechnic of North London, Holloway Road, London N7 8HQ.

PARAMIN, LTD.
SOUTHVIEW
SOUTH CLOSE HORSELL
WOKING SURREY (04862) 20261

Mini/Micro Specialists

SALARY TO .... £8,000+

Paramin (U.K.) Ltd is a newly-formed subsidiary of an American Systems House, currently in the process of opening an office in Maidenhead, Berkshire. The company specialises in technically-challenging projects on both Minicomputers and Microprocessors. Examples of projects in which Paramin has been involved are as follows.

- 3270 Emulation on Intel 8080
- Message Switch design and implementation on ICL 1500
- Software Diagnostics on hybrid micro array processor
- Software Diagnostics on Prime 300 for new target Mini
- Real-Time operating system design on Hewlett-Packard 1000 Series
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THE UNIVERSITY OF LIVERPOOL

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Application forms from The Registrar, The University, PO Box 147, Liverpool L69 3BX.

Quote Ref. RV-448-CW

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Ref. AW/1101

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Ref: 1041

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Ref: 1017

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Ref: 1023

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Ref: 1043

FOR DETAILS OF THESE AND OTHER VACANCIES PLEASE CONTACT JOAN JOHNSTONE

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هكذا من الأصل

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Please telephone or write for an application form, quoting Post 772 to the Staff Office, Portsmouth Polytechnic, Alexandra House, Museum Road, Portsmouth, telephone Portsmouth 27681, Ext. 317.

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Applications, together with curriculum vitae and the names and addresses of 2 referees, should be sent to Dr G. S. King, Chemical Pathology Department, Queen Charlotte's Maternity Hospital, Goldhawk Road, London, W6 0XG, by Monday, February 5, 1978.

Readvertisement is necessary due to the failure of the appointed person to take up the position. Previous applicants who wish to be reconsidered should notify Dr. King.

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ACTION	—	Phone for initial discussion or write for an appointment. Ref. DS3.

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This project involves the development of systems associated with Air Traffic Control, Cargo Hendling end Reservation Systems based on large meinframe hardwere with Deta Base facilities. Analysts and Anelyst Programmers ere required for this project.

Applications Programmers

Severel Programmers with Assembler and/or COBOL backgrounds ere required for commercially orientated projects in Southern Germany. IBM 360/370 or similar type hardware experience is required. Start detes ere likely to be during March 1979.

Northern Europe
To around £16,000

Commercial Projects

Analyst Programmers and Programmers are also required by the above client for commercially orientated assignments. Experience should include Univac 1100 JCL plus FORTRAN and/or COBOL although FORTRAN and COBOL on other hardware will be considered.

To apply for these positions, or for further details, please contact Roger Allington on 01-242 9356 (day) or Berkhamsted (04427) 2299 (evenings or weekends) if more convenient.

Ref. 111/CW/RA

Member of Computing Services Association

MYRIAD

BASILDON

PROGRAMMER **To £6250**

This is an excellent opportunity to join a progressive O.P. department. Our client will shortly install the new IBM 8140 distributed processor which they will utilise both to front-end large 370 mainframes at a remote site and to process on-site at their Basildon headquarters.

We wish to appoint an experienced programmer who will play an important role in the further development of computing facilities for the organisation.

Candidates should offer sound COBOL programming experience, preferably gained in a manufacturing environment. Most important is the ability to function well without constant supervision and to have the potential to develop a successful career with a forward looking organisation.

- Ref SE1/1101

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981 (24 HOURS)

JBA

SOFTWARE DEVELOPMENT/ SUPPORT ON-LINE COMMUNICATIONS NETWORK

Our client, part of a large and diverse British manufacturing group and itself a very substantial company, is currently developing a new range of commercial systems for both their IBM 370/138 and a new on-line network of 8 PDP 11/70's.

To provide development and software support for the installation of the new network, the following professional programmers are urgently required.

Software Specialist **salary to £8,000 pa**

Candidates should possess extensive knowledge of DEC software, comprising a minimum of 3 years in software, preferably on RSX 11M systems. The appointee will be supporting both the network system and the applications programming teams - a wide range of responsibilities.

Assembler Programmers **salary to £7,000 pa**

The successful candidates will be working on the development of the communications network, so preferred applicants will have an RSX 11M MACRO 11 background. However, applicants with at least 2 years ASSEMBLER experience on other types of hardware will be considered, and if appointed will be given full DEC training.

Contact Mark Gill for further details

JAMES BAKER ASSOCIATES
International Personal Consultants
16 Maddox Street London W1
Telephone: 01-491 4478

Job in hits

A NEW CAREER IN SCOTLAND!

On February 1, 1979, a special recruitment feature highlighting career opportunities and job prospects in Scotland will be published.

To advertise in this important feature contact:

Owen Kelly on 061-872 4211
or
John Farrar on 01-261 8098

Operators: Contract/Salaried! Top Rates! UK & Overseas!

Immediate contracts: System 4, 1900 George 2 & 3, 2900

Our requirements for top-class Operators are continuously expanding, throughout the UK and abroad.

As Europe's leading software house we regard all these things as important,
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- providing real job satisfaction
- offering good career prospects.

Shiftleaders and Operators with at least 2½ years' experience should contact Andy Woodham or Graham Whittaker on Reading (0734) 581258 extension 36 or 46, reversing the charges. Or write to Andy Woodham, Operations Services, ICL Dataskil, Reading Bridge House, Reading, Berkshire RG1 8PN, quoting reference CW1178.

ICL Dataskil
The Computer Professionals

West Sussex County Council

Assistant Computer Programmer Post No. 192
or
Trainee Assistant Computer Programmer

Salary £1821-£2895

County Surveyor's Department

The post is one of three providing computing support to Engineers and Technicians in the Transportation Studies Group. Extensive computing facilities are available, and these will be substantially improved during 1979.
Candidates should hold an appropriate degree or other computing qualification and have experience of Fortran and IBM/OS.
If you are qualified to "A" level, then we would consider appointing you as a Junior Trainee on the lower scale with opportunities for academic training in computing.
For further details about the job telephone Roger Jones on extension 585.
Starting salary will be dependent upon qualifications and experience.
Excellent removal, resettlement and lodging allowances are payable in approved cases, and there is also the possibility of temporary accommodation.

Application forms from County Surveyor, County Hall, Chichester, or telephone Chichester 785100. Ext. 413/456.
Closing date for applications 29th January, 1979.

CAPITAL APPTS.
GRADUATES
Urgently required for Trainee positions. Industrial, scientific and Commercial situations.
SALARIES c. £3,000
ALL AREAS
29 Windmill St. London, W.1.
637 5551 day; 636 9659 eve.

HOWARD

PROGRAMMERS
C£24,000 P.A.

We require several programmers with experience of CORAL 66, RTL 2, PL/1 and/or MACRO 11 on PDP 11's to work on an interesting overseas contract.
This involvement is the software design, coding, implementation and debugging, prior to formal QA, of modules within a large suite of programs. A working knowledge of RSX 11M and X25 protocol would be a distinct advantage.
The project is operated on a team oriented basis and for the right person can represent involvement into late 1980.
Ref: DBO7D1-79
Telephone now for further details.

The Overseas Recruitment Consultant
HOWARD ORGANISATION INTERNATIONAL LIMITED
Employment Business Section
8 Elstree Way, Boreham Wood, Hertfordshire
Tel. 01-953 4066

A New Year – A New Challenge

This is your opportunity to join one of the world's most advanced computer centres.

Purpose built and costing many millions it has the most varied equipment you are likely to find anywhere.

The transfer of the remaining IBM Mainframes within the Company has been completed to schedule and as a result of this and the continuing growth of the centre we are now looking for additional:

Senior Computer Operators
Master Terminal Operators

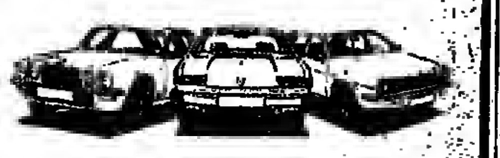
Our equipment consists of 1 x 3033, 2 x 370/158 and 2 x 370/145, so you will need experience in at least two of the following areas: VM, DOS/VS, VSII, HASP,M MVS, TSO, IMS or CICS. But equally important you should have a genuine interest in computing as a career.

Benefits are those associated with a major company and include 5 weeks' holiday, pension, life assurance and sick pay schemes, substantial discount on BL cars and accessories.

Generous relocation assistance will also be provided to this pleasant, rural area, where housing is favourably priced.

So, if you're looking to be part of a successful team, make your New Year resolution now. Ring Rod Wallis on Redditch (0527) 28515 or if you prefer write for an application form to:

Operations Manager
BL Cars Limited
Data Centre
PO Box 5
Redditch, Worcs.



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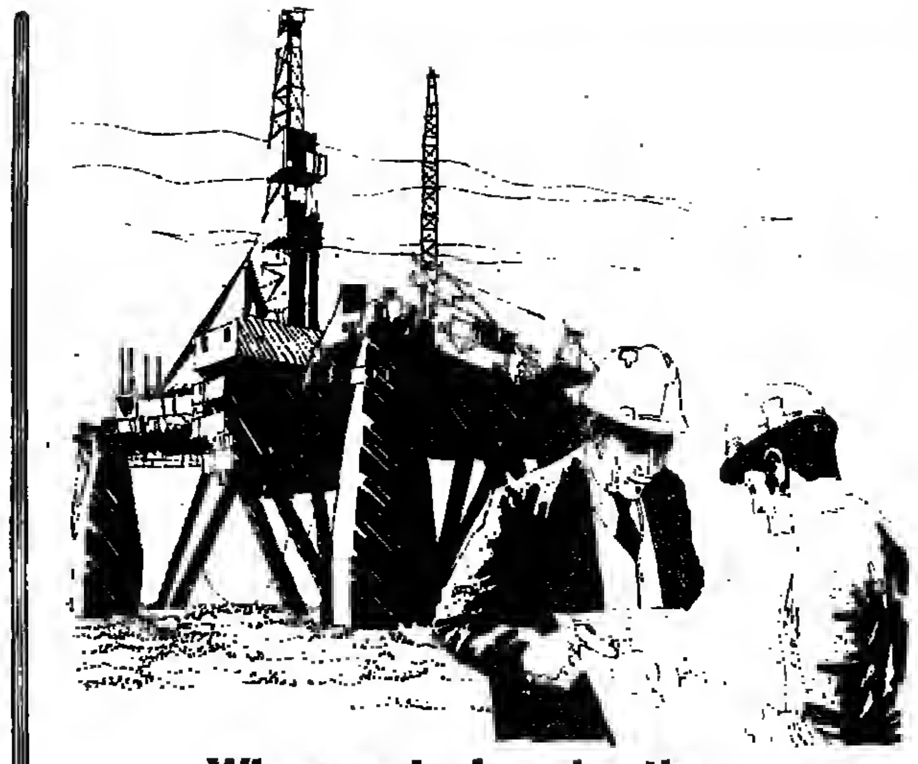

When you're keeping the North Sea's bounty flowing, you need the best software professionals in the business

wesdac
Wesdac Systems, Wokingham, Berkshire

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
DEPARTMENT OF APPLIED MATHEMATICS

SENIOR LECTURER/ LECTURER IN THE DIVISION OF COMPUTER SCIENCE

Applications are invited from persons with interests in certain of the following areas: Data Base Theory and Design, Design and Analysis of Algorithms, Numerical Analysis and Software Systems. Appointees will be expected to teach, update and design courses at undergraduate and post graduate level and to participate in research activities.

Applicants should have a masters or doctorate degree and experience in computer science lecturing and research, although both these conditions may be waived if the applicant is in possession of equivalent professional qualifications.

The salary and level of appointment will be determined in accordance with qualifications and experience. Salary scales will be reviewed in April 1979 but the following existing ranges can be taken as guidelines:

Senior Lecturer:
R10 144-R13 489 per annum

Lecturer:
R7 654 — R11 807 per annum

The University's policy is not to discriminate in the appointment of staff or the selection of students on the grounds of sex, race, religion or colour. Further particulars relating to this practice and to the above posts are included in the information sheet obtainable from the London Representative, University of the Witwatersrand, Chichester House, 278 High Holborn, London WC1V 7HE, or from the Registrar, University of the Witwatersrand, Jan Smuts Avenue, Johannesburg 2001, South Africa, with whom applications should be lodged by 28th February, 1979.

O & M OFFICER
£8012-18316

Close liaison is maintained with the Computer Unit and an early assignment of this post will be to participate in a joint project with Computer staff on the long term strategic review of the Council's computer utilisation.

Applicants should be capable of discussing work effectively with senior management, writing clear and concise reports, experienced in interviewing and capable of dealing with all stages of investigations with the minimum of supervision. They are likely to be educated to degree standard or have a suitable professional qualification, and have three years relevant experience. Knowledge of computer applications would be desirable but is not essential.

Application form from Personnel and Management Services Officer, London Borough of Greenwich, Peggy Middleton House, 50 Woolwich New Road, London, SE18 6HO. Tel. 01-854 8888 ext 2116.

Closing date 26th January 1979.

The Council is an equal opportunities employer. All applicants will be considered, irrespective of sex or country of origin.

GREENWICH

D.P. OPPORTUNITIES
OIL RELATED ENGINEERING

McDermott is one of the leading names in the field of offshore engineering. Employing over 25,000 worldwide, we are involved in the design, fabrication, installation and overall construction management of sophisticated marine engineering projects providing a comprehensive service to the oil and process industries.

To keep our projects on target we now wish to recruit the following personnel who can make an immediate contribution to our continued success;

Senior Analyst Programmers
Middx. (c.£8,000)

Required to both develop commercial systems using our IBM 370/138 with OS/VS1 and provide assistance in the transition from batch to on-line systems.

Aged 25-35 and educated to degree level, applicants male or female, must have a thorough knowledge of O.S., PL1, and CICS (IOMS Database experience would be an advantage). In addition, we will be looking for the ability to develop effective systems on schedule and produce a high standard of documentation for management, programmers, operations and users.

We can offer an attractive number of employee benefits including generous relocation assistance where appropriate.

Systems Programmer
Dubai-U.A.E. (c.£8,000 Tax free)

Required to develop and modify complex software programs to improve the efficiency of the operating system involving close liaison with both scientific and commercial systems personnel.

The installation is an IBM 370/138 operating under DOS/VS.

This challenging position calls for degree calibre applicants with a minimum of four years D.P. experience, one of which must be in systems. The contract is available for married or single status employees and we can offer a very attractive range of benefits.

Full job description and employment details available on application.

To apply for either of the above positions you should write giving full details of your career to date to: I. R. Spairs, Personnel Supervisor, McDermott Engineering London, McDermott House, 140 Wembley Park Drive, Wembley, Middlesex.

McDERMOTT ENGINEERING

Senior SYSTEMS ANALYST

LONDON W1 — **Up to £7,500**

This is an opportunity for an experienced Systems Analyst to join a major West End (Mayfair) installation, and to work on a variety of new projects, using database, transaction processing and communications techniques. However, knowledge of such techniques is not mandatory — appropriate training will be provided.

Our clients have a large dual processor mainframe with extensive communications facilities. There is ample development work, often of a technically challenging nature, and the environment is one of good professional standards. There will be a cost of living increment next April, and fringe benefits include a non-contributory pension scheme and a staff restaurant.

This opportunity will interest well educated, presentable and articulate individuals who have had a sound computing background, including several years systems analysis, and who now wish to extend and update their experience. Team leadership experience of capability would be valuable.

Please ring us in confidence for a preliminary discussion, quoting ref. 672, or leave a message on our answering machine and we will contact you.

EDP SYSTEMS 01.637 5796
52-53 Margaret St. London W1N 7FF

OPERATORS — targa

IF YOU HAVE SIX MONTHS' OR MORE EXPERIENCE ON ANY MACHINERY AND LOOKING FOR SOMETHING NEW IN LONDON OR THE HOME COUNTIES PLEASE CALL US TODAY. BELOW ARE JUST A FEW OF OUR CURRENT VACANCIES.

IBM	DS	CHIEF DP	4 YR	£5000c	ESSEX
IBM	DS	OPERATOR	1 YR	£4300	C. LONDON
IBM	DDS	SHIFT LDR.	2 YR +	£5200	S. LONDON
IMB	DDS	OPERATOR	1 YR +	£4500	C. LONDON
ICL	GII/GIII	OPS/SHIFT LDR	1 YR +	£6000c	W. LONDON
ICL	GII	SHIFT LDR	2 YR	£4800	W. LONDON
ICL	GII	OPERATOR	1 YR	£4300	C. LONDON
ICL	2900	OPERATOR	1 YR	£4000 +	E. LONDON

DATA CONTROLLERS — WE HAVE MANY VACANCIES IN ALL AREAS, £3000-£5000

FOR MORE DETAILS PLEASE CALL TODAY

TARGA COMPUTER DIVISION

3 LIVERPOOL STREET
LONDON EC2M 7NH
01-283 2751

Hertfordshire County Council
MID-HERTS/BOREHAM WOOD COLLEGE
Department of Computing, Science & Technology

LECTURER I

for Programming (COBOL and BASIC) and Business Data Processing. Sound commercial experience needed, preferably with teacher training or experience. Part-time applicants also welcomed.

Further information and application form from the Principal, Elstree Way, Boreham Wood, Herts (Tel: 01-953 6024/6).

LIVERPOOL POLYTECHNIC
DEPARTMENT OF ARCHITECTURE

COMPUTER PROGRAMMER — SRC GRANT

THE POLYTECHNIC OF CENTRAL LONDON
Computer Centre

COMPUTER MANAGER

COMPUTER MANAGER

required by NALGO. Applicants must have ability to control, coordinate and develop the computer work of the Association and be fully conversant with both the systems and operations aspects of computing.
Salary: £7488-£8229 p.a. including London weighting allowance.
26 days annual leave plus additional leave at public holidays. Partial mortgage interest rebate. Contributory pension scheme. Staff restaurant. Removal expenses.
Application forms and further details available on request from: The General Secretary, National and Local Government Officers Association, 1 Mabledon Place, London WC1H 9AJ.

Closing date for receiving completed application forms, 18 January, 1979.

هكذا من الأصل

THE FUTURE CHANGES WITH EFFECTIA GRAVIS

SYSTEMS DEVELOPMENT VACANCIES

Senior Systems Programmer COBOL/Assembler	£6300	**Kent** Ref. M2755
Senior Programmer 4 to 5 years' COBOL	£7000	**Herts** Ref. L2821
Programmer IBM Assembler	£7000	**City** Ref. B3840
Programmer OS COBOL	£5000 + Car	**Middx.** Ref. B4921
Programmer Mini Assembler	£7000	**N. London** Ref. C2862
Analyst/Programmer COBOL/CORAL	£7000	**Leeds** Ref. B2856
Senior Project Leader COBOL+Communications Exp.	£6000	**Cambs.** Ref. M2826
Programming Team Leader COBOL/Commercial Applications	£7000+	**W4** Ref. L2742
Systems Analyst Commercial/Business Systems	£6500	**W4** Ref. M2810
Systems Programmer Mini Software/Assembler	£8000 + Car	**Bucks.** Ref. C2850
Senior Programmer COBOL/ALGOL	£7000	**E. Anglia** Ref. C2854
Software Support Mgr. Exec.8 Software	£7500	**London** Ref. C2851
Senior Analyst O & M or PL1 experience	£7500	**Middx.** Ref. B2855
Systems Analyst 5 yrs COBOL/Commercial Applications	£6500 + Car	**Middx.** Ref. L2740
Senior Programmer COBOL+DBMS experience	£6500	**Middx.** Ref. L2740
Programmer 2 years' ICL COBOL	£6000	**N18** Ref. M2837

01-439 6481
(24-HOUR ANSWERING SERVICE)

CONTRACT VACANCIES

IMMEDIATE

ICL 2900 VME8 Operators
IBM OS JCL Database Technician
ICL 1900 G2 and Manuel Operators
ICL System 4 J1800 Operators

FORTHCOMING

By the end of January we will be reading between 20 and 30 IBM OS and DOS, ICL G1/2/3, ICL 2903/2960, Honeywell (all), and Univac Operations Staff.

We pay excellent rates (and expenses)

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(24-HOUR ANSWERING SERVICE)

RECRUITMENT CONSULTANTS

In 1978 Effectia Gravis once again confirmed its position as one of the largest, most respected computer personnel consultancies in the U.K.

Business was up from the previous year by over 50% and our aim for 1979 is to maintain this growth rate.

To achieve this, we need more consultants, with the following attributes: common sense, the ability to communicate on all levels, and the will to succeed.

Quote ref. EG1.

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OPERATIONS VACANCIES

Operator DOS VS or OS VS	£5000	**S. Coast** Ref. B2861
Operator Exec 8	£4800	**S. Midlands** Ref. B2833
Operator DOS VS	£4000	**W1** Ref. C2827
Shift Leader GIII/DME	£6000	**Middx.** Ref. L2841
Shift Leader GII	£5500	**Essex** Ref M2830
Senior Operator GIII/DME	£5000	**Middx.** Ref. M2840
Senior Operator GII	£4300	**Essex** Ref. L2832
Operator GCOS	£4500	**Essex** Ref. B2858
Operator GCOS	£5000	**Surrey** Ref. C2859
Operator J1700/J1800	£4700	**W. Country** Ref. C2705
Operator DOS Power	£4000+ Bonus	**City** Ref. B2860
Senior Operator New Range GII	£4500	**City** Ref. L2845
Data Control Supervisor ICL Data Control experience	£6000	**SE1** Ref. L2866
Senior Operator GII	£4700	**Essex** Ref. M2870
Data Controller 18 months' Mainframe experience	£3500	**S. London** Ref. M2824
Trainee Operators To work with IBM Mainframe	£3000	**Surrey** Ref. B2857

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COMPLETE AND RETURN TO **EFFECTIA GRAVIS NOW** (BLOCK CAPITALS PLEASE)

Name (in full) .....

Address (Permanent) .....

Telephone: Home ..... Office .....

Type of Transport ..... Date of Birth .....

Current Position (Contract / Permanent) delete ..... Salary/Rate .....

Position Required (Contract / Permanent) delete ..... Salary/Rate .....

Notice Required/Date Available (delete) .....

Areas Preferred: First Choice ..... Second Choice .....

Experience to date: (Last Position First)

Company: Name and Location	From Mth/Year	To Mth/Year	Duties and experience

Date ..... Signature .....

Reg No. DATE CW/11/1/79

Whatever level you have reached in the Computer Industry, you wouldn't be human if the chance of bettering yourself wasn't taken.

Does one or more of the following apply to you?

1. Looking for a new contract?
2. Seeking a more responsible permanent position?
3. Require a more lucrative contract?
4. Want to be financially rewarded for your experience?
5. Need help and advice on your future career?

We could go on listing (ad infinitum) the reasons to complete and return our coupon.

The best New Year idea you could have is to return the completed coupon as soon as possible.

01-439 6481 (24-HOUR ANSWERING SERVICE)
EFFECTIA GRAVIS
NATIONAL HOUSE, 68 WARDOUR STREET, LONDON W1V 4HP
COMPUTER PERSONNEL CONSULTANTS
LICENCE No. SE(A)82

Anglian Water Authority

DATA BASE PROJECT LEADER

Ref. H3001O

£7,778-£8,362 including supplement of £312

The Authority is implementing a computer service to support financial and scientific systems. The service is based on a central mainframe computer with data communications links to divisional offices.

A Project Leader is required to be responsible for the design and administration of the data bases required to support the Authority's application systems

Applicants should have expertise in the following areas:
- ★ Data Analysis
- ★ Logical data base design
- ★ Physical data base design (preferably using CODASYL DBMS)
- ★ Data base performance monitoring
- ★ Project management

The Authority offers excellent conditions of service and generous removal expenses if relocation is necessary.

If you are interested or want to know more about this opportunity why not call Jenny Spencer at Huntingdon (0480) 61181 Ext. 370 for information and an application form.

The closing date for application is 26th January, 1979, and should be sent to:

ANGLIAN WATER AUTHORITY
Diploma House, Grammar School Walk
Huntingdon, Cambs.

Northern Regional Health Authority

Computer Programmer

Applications are invited for the post of computer programmer in the Authority's Statistical Section. The successful man or woman will join a small team working on a variety of applications in the statistical operational research and clinical research fields

Candidates should be of graduate or equivalent status and must have pursued a course with a substantial mathematical or statistical content. Practical experience of programming for ICL computers, and of the George III operating system would be an advantage, but is not essential as training will be given

Salary scale £3452-£4421 p.a. (New entrants to the N.H.S. will normally commence on the minimum of the scale)

Applications form and job description available from the Regional Personnel Officer, Northern Regional Health Authority, Benfield Road, Walkergate, Newcastle upon Tyne, NE6 4PY, to whom completed applications should be sent by 29th January 1979.

COVENTRY CITY COUNCIL

Operations Controller

Salary up to £8702

THE JOB To plan, control and motivate the activities of all staff in the Operations Section with particular attention to day-to-day matters.

THE INSTALLATION A large ICL System 4/72 on 3 shifts, due for replacement between 1980 and 1982. Data preparation by a dual processor key to disc system with 24 key stations on 2 shifts.

REPONSIBLE FOR about 60 full-time and 30 part-time staff working a variety of shift arrangements in operating, data preparation and control.

RESPONSIBLE TO the Operations Manager who will be devoting the majority of his time to the equipment replacement study over the next year.

EXPERIENCE REQUIRED It is unlikely that anyone with less than 5 years in computing would have the experience and maturity sought. However, this experience could have been gained in any or several of the relevant areas. Considerable supervisory experience is necessary either in one such area in a large organisation or as manager in a smaller one. Systems or programming would be considered as relevant areas.

CONDITIONS OF SERVICE At least 28 days' annual leave plus 12 fixed days. Staff canteen, sports facilities, local government sick pay and superannuation. No shift working is required but some out of hours involvement is inevitable.

SALARY Starting salary in range £5727-£6342 according to experience, progression possible to £8702. A conditional grant of up to £550 may be available towards legal and removal expenses.

INFORMATION? Please write to Mike Rowe, Operations Manager, Computer Division, Council House, Earl Street, Coventry CV1 5RQ, or telephone him on 0203 28568, Ext. 2723 (outside office hours ring 0203 28711) for further details and application form.

Closing date for completed application form is 26th January, 1979.

coventry

UNITED KINGDOM ATOMIC ENERGY AUTHORITY

Computer Operators at Harwell

We have vacancies for operators to work on the Central IBM 370-168 installation (soon to be replaced by an IBM 3033) at Harwell, providing opportunities to take part in utilising one of the world's largest computing complexes.

Applicants with previous operating experience of IBM computers will have an advantage, but full training will be given to successful candidates.

Starting salary depends on age and experience, with appointments being made in the Data Processor or Senior Data Processor grades. Promotion to Senior Data Processor is often obtainable within 12 months. Operators must all be available for shift working. With shift supplement, the annual salary range for Data Processors is from £2,805 to £3,278 and for Senior Data Processors from £3,942 to £4,333.

For further details and application form, please contact: Mrs. R. A. Stevens, Personnel Department 'B', AERE, Harwell, Oxon OX11 0RA. Telephone: Abingdon (0235) 24141, Ext. 2946.

HARWELL

Potential Sales Executives

Circa £7,000 + Car

for the NORTH and SOUTH to be trained to market their Data Communications Equipment. Ideally we are looking for young men or women with relevant job experience who feel that given the opportunity they have the right personality to develop their career in sales.

+

Sales Engineer

(Worldwide) C. £10,000 + Car

to market one of its latest developments in the telex multiplexer field. The right man or women will probably have a technical / engineering background in the telecommunication industry and must be willing to travel extensively. Experience of overseas selling would be advantageous, though full training will be given

CASE is a young energetic company specialising in the manufacture of data communications systems. The company's products include multiplexers, concentrators, modems and message switching systems. Continuing expansion provides an opportunity to join an enthusiastic informal group in a job where salaries, conditions of service and career opportunities are excellent

CASE

ASSESSMENT
Mercuri Urval
CONSULTANTS

Please write in the first instance, with full personal and career details, quoting reference No. 812 to:
Ross M. Ormrod
Mercuri Urval Limited,
135A High Street,
Rickmansworth, Herts. WD3 1AR

Principal Scientific Officer

The Research & Development Division of the British Railways Board at Derby has a vacancy for a Principal Scientific Officer in the Transport Technology Assessment Group. The group undertakes wide-ranging studies to reveal the opportunity for technological advances in the various rail businesses. To aid in the evaluation of emerging proposals we are seeking an experienced individual with professional qualifications or relevant degree to join a small team engaged in developing transportation systems assessment methods.

The work requires expertise in computing (Fortran) and transportation modelling, with a working knowledge of the statistical, econometric and simulation techniques involved.

The person appointed will be expected to initiate and develop analytical methods and also to undertake systems synthesis studies of innovative approaches.

The commencing salary will be within the range £6774 to £6554. There is a contributory pension scheme and the transfer of existing pension rights can, in most cases, be accepted. There are also free and reduced rate rail travel facilities.

Applications stating age education, qualifications and experience should be sent to:-

Headquarters Staff & Services Manager, British Railways Board, 222 Marylebone Road, London NW1 6JJ, quoting reference R8263.

LATENT VACANCIES

i.e. JOBS NOT ADVERTISED IN SURREY, SUSSEX, KENT MIDDLESEX, BERKS, HANTS

FOR ANALYSTS AND PROGRAMMERS

Analysis has shown that jobs advertised by companies are few compared with the total number of vacancies available. Latent vacancies account for the greatest number of jobs available now.

Most companies in these areas register their vacancies with our consultancy as we have an established successful record specialising in the recruitment of computer personnel and executives.

We therefore have extensive knowledge of most latent vacancies in the South and South East — the equipment, languages, salaries and career prospects. We can inform you of vacancies that suit your requirements in the area of your choice.

This free information is just a phone call away. We have done the job-search, you phone us now and take advantage of our services.

Telephone: Weybridge (0932) 41321 (Consultants).

pb executive (weybridge) TELEPHONE 0932 41321

UNIVERSITY OF WARWICK

DATA PROCESSING OFFICER

Applications are invited for the post of Data Processing Officer in the University Central Administration, tenable as soon as possible. Salary will be on the Grade II scale £8,317-£7,764 p.a. (under review). Further particulars may be obtained from the Secretary and Registrar, University of Warwick, Coventry, CV4 7AL, to whom written applications (in forms) naming three referees should be sent by 15th January, 1979. Please quote Ref. No. 20/78/78.

Puzzle Answer

THE smallest prime-sum for ten different digits is 567, using either 2+3+5+67+89+401, or 2+5+7+61+83+409.

Computer Programmers

c. £6,500 Herts

Everest Double Glazing, a member of the RTZ Group, are manufacturers and distributors of high quality double glazing products with branches throughout England.

Currently our DP section is expanding its mainframe and consequently Programmers are required to assist in the development of new systems and the maintenance of existing systems.

Men or women, with at least two years RPG experience, are sought. Applicants should be self-starters, able to work hard and assimilate new data quickly.

As well as a good starting salary, career prospects within the Group are excellent.

a member of the RTZ Group

Please write with brief details to M.D. Kings, DP Manager, Everest Double Glazing Limited, Everest House, Cuffley, Potters Bar, Herts.

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'79 IS THE YEAR OF THE CONTRACTOR
KNIGHT'S CONTRACT DIVISION

MIDLANDS AND N. ENGLAND

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NORTHWEST
CICS OL/1 CDBOL PROGRAMMER .. c.£230
NORTHWEST
CICS PL/1 DL/1 CONSULTANT ..... c.£250
MIOLANDS
IMS PL/1 PRDCRAMMER .... c.£230
MIDLANDS
IMS COBOL PRDCRAMMER .... c.£230
MIOLANDS
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OFFICES: AMSTERDAM PARIS MANCHESTER BIRMINGHAM

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Our client is an international manufacturing company with associate companies throughout Europe. They retain IBM 370 under both DOS/VS and CICS/VS with an international telecommunications network for voice, message and data linking the UK, Holland and U.S.A. The successful candidate will have responsibility for both UK and Dutch operations, provide effective facilities for information services and management of local computer network. Part of role will be evaluation and advice on new hardware so familiarity with current hardware technology and related telecommunications equipment is a must.
* Excellent career prospects
* Subsidised restaurant, sports and social club
* Location in rural and pleasant park grounds
* RELOCATION expenses REF 1926

£8500

EDP AUDIT
LONDON

Our client, a British based banking organisation, is currently extending applications both in U.K. and overseas. A highly motivated professional is needed to undertake formal audits of world wide network of data centres, to undertake system reviews of all projects under development, participating in the cycle of systems development from project initiation through to live running and formal sign offs. Also EDP audit retrieval programs for proving systems and assistance to field auditors. Ideal applicant will have exposure to IBM and preferably PDP on line experience and use of audit retrieval program and/or programming knowledge COBOL or BASIC + Co offers
* SUBSIDISED MORTGAGE
* Travel overseas
* Non contributory pension scheme
* Unusual scope for career development REF 2005

SENIOR SYSTEMS ANALYST
LONDON

Excellent opportunity exists for a senior systems analyst to work within an international company providing financial information and real time systems. Ideal applicant will have a good technical IBM background in a banking or financial organisation and experience of investment accounting as he/she will play an important role in major systems of this type. If you want to work in a professional and stimulating environment phone NOW!
* Friendly atmosphere
* Season ticket loan scheme
* Non contributory life ass. + Pensions schemes
* ... L.V.s REF 1950

£8000

PROJECT LEADER
LONDON

With turnover of £20m our Client, a major group of companies, has business interests in the U.K. and overseas specialising in the provision of a wide range of products and services to various professions. Retaining PDP minis they seek person with a good programming background and at least 12 months as a project leader with one project handled from design to implementation. This is a responsible position for someone who wants to enhance their career development. Co offers:
* Opportunities for promotion to manager with a company car
* Working on a wide range of applications including micros, minis and mainframes

REF 1987

ANALYST PROGRAMMER
LONDON

Enhance your career, this is a fantastic opportunity to progress in major oil company. If you have good IBM experience, programming in COBOL and ASSEMBLER or MARK IV and at least 2 years as an Analyst Programmer apply NOW. Position involves working on financial and commercial applications and to become involved with database systems, thus IMS would be an advantage. Co offers
* Regular salary reviews —
* Excellent career prospects
* Easy access from south — close to major rail station

REF 1883

SYSTEMS ANALYSTS
SURREY

Management can be yours! Have you the ability to make practical contributions to business decisions, communicate effectively at all levels and at least 2 years' IBM systems analysis experience? If so our client, part of a large insurance and financial conglomerate, would like to discuss your future. Rapid career progression and lots of client liaison. Co offers:
* Free life assurance
* Free BUPA
* Sports and social club
* Subsidised staff restaurant and luncheon vouchers
* Regular salary reviews

REF 1909

TEAM LEADER
CITY

Unique opportunity exists within this multi national communications conglomerate retaining large PDP minis. Company is currently engaged in the development of major international message switch systems using MACRO ASSEMBLER RSXII and RTLII. Ideal applicants should have 5 years experience in Real Time programming in Macro Assembler and RSX with message switch experience preferably. If you have this experience plus the ability to lead a small team phone NOW! Co offers
* Up date technology
* Regular salary reviews
* Excellent career structure

REF 2006

£7K

SENIOR PROGRAMMER
CITY

Due to expansion this multi-national bank has an opening for a programmer with at least 4 years' ASSEMBLER experience to work on IBM 370 which runs under DOS/VS. This is a very varied position which involves many new and interesting projects related to international finance. If you have the right experience and strong will to succeed then apply NOW. Co. offers:
* Subsidised Mortgage
* Loan Scheme
* Annual Bonus
* Non-contributory pension scheme
* Excellent prospects for promotion

REF: 1986

SENIOR PROGRAMMER
MIDDX

Our client, a computer bureau of well-known international manufacturing company, seeks senior programmer to develop and work on various new accounting packages. Ideal applicant will have at least 3 years' programming in COBOL on IBM hardware. This is a super opportunity to follow career path, they are awaiting delivery of 3033 in March and lots of new development work is planned. Co. offers:
* Flexi time
* Continued development in well planned schedule
* Progressive organisation
* Plenty of room for growth and excellent earning potential

REF: 1999

PROGRAMMER
N. LONDON

Our client is a major prestige organisation providing services to the British banking industry. They retain large ICL 1900/2900 hardware and are currently developing a major on-line communication system. Applicants should have at least 3 years' ICL COBOL experience and will be trained on new techniques in teleprocessing. Co. offers:
* MORTGAGE SUBSIDY
* Relocation expenses
* Non-contributory pension scheme
* Personal Loan Scheme

REF: 1968

SYSTEMS ANALYSTS
BUCKS

Major manufacturing company has set up new installation in Buckinghamshire and seeks systems analysts to be responsible for various project teams. Hardware consists of 2 ICL 2950's linked to their other installations. This is an excellent opportunity to get involved at the beginning with fantastic career prospects. They will also consider analyst programmers to train in systems analysis. Co. offers:
* RELOCATION
* 5 weeks' hols
* Non-contributory pension and sickness schemes
* Excellent career prospects

REF: 1988

SENIOR PROGRAMMER
CITY

As a wholly-owned subsidiary company of one of the largest firms of chartered accountants in the country, our client seeks a programmer for its expanding D.P. dept. With IBM 370 equipment their position is for person with approx. 3 years' IBM COBOL experience and to work on a variety of business packages.
* Opportunity to be involved in the business of very well established company

REF 1961

SENIOR PROGRAMMER
N. LONDON

Our client, a major American company engaged in the production and marketing of electronic equipment, is seeking a programmer who has at least 2 years' programming in RPGII. They retain IBM System 3 at present but will consider ICL RPGII experience. Ideal applicant is someone prepared to work in a small team, prepared to accept responsibility, to write programs but also get involved in systems analysis and the general running of the installation. Co. offers:
* COMPANY CAR
* Bonus
* Friendly and lively atmosphere

REF: 1947

KNIGHT PROGRAMMING SUPPORT LIMITED

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